

# THIS WEEK IN THE IRON AGE

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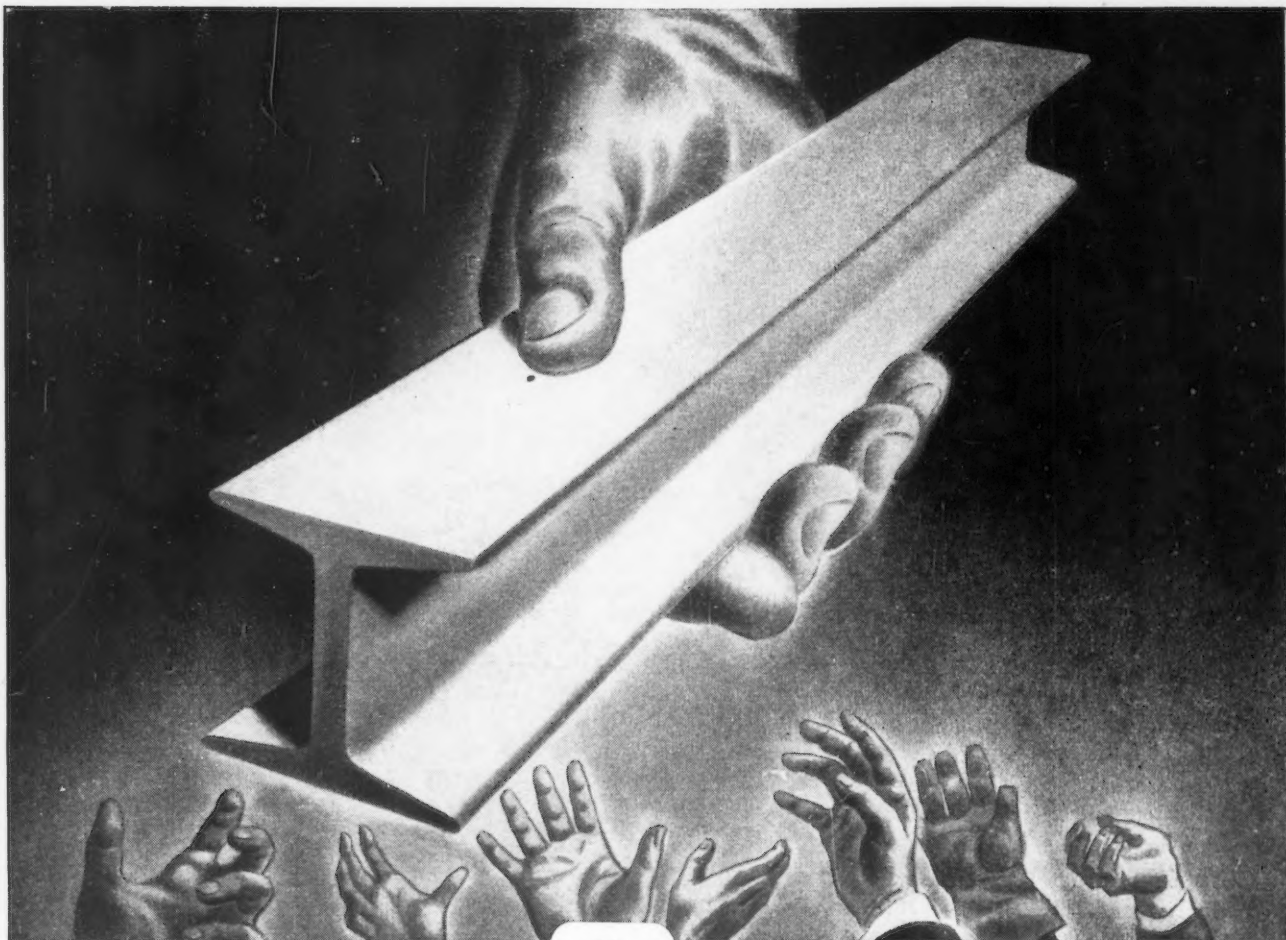
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## Brother, can you spare a beam?

Steel is like money. When you need it, you need it *badly*. That's why we have many steel plants to give next-door service most anywhere.

But lately it's getting so we hesitate to open the mail or answer the phone. We *know* there will be friends asking for steel—steel they need badly—and often we just are not able to fill the bill.

### And here's what's causing it all

For a while it looked as though production would soon catch up with demand. Now that time seems more distant. The many things holding up top steel production have been slow to clear away. Unpredictable stoppages keep popping up, and shortages have brought other delays. You know about many of them. We've been doing our best, but for reasons

beyond our control, we're still getting orders we can't fill.

### But remember this:

One of these years the steel situation is going to change for the better. When that happens our plants will be among the first to stock products now hard to get and we'll burn up the roads rushing your steel to you. In preparation for that day, we're improving and expanding facilities, to protect the quality of Ryerson steel and ship it to you faster.

We are even now building a new plant and adding extensively to equipment at 11 others.

Meanwhile, the steel you need or a practical alternate may be in stock. So contact the nearest Ryerson plant with the full knowledge that we will do everything in our power to work with you.

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## Bathtubs Minus Jobs

IN these days of material shortages, and they will continue for some time yet, the disposal of what we have is a most important procedure. Normally this is taken care of by supply and demand, but currently these twins have been dismissed from the stage and individuals appointed by the government have taken their places. How well the substitution has worked is a moot question.

Take, for example, the matter of cast iron. Cast iron is one of our most versatile materials and it is in short supply. Cast iron goes into almost every industry and line of productive endeavor. The machine tool industry recognizes it as its principal material. Automobile motors have it as their chief constituent. Steel, mining, chemical, railroad, food processing, the clothing industry, via textiles, cannot exist without it; indeed it is difficult to name a line of productive endeavor that is not dependent upon merchant and malleable cast iron for its existence.

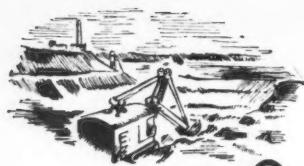
Now you cannot put your cast iron into bathtubs for veterans; at least not an excessive proportion of the supply and have enough left to make jobs for them too. I think if a vote were to be taken among the GI's, the job would take preference to the bath. The latter is something that most of us can take or leave as the occasion warrants.

The present merchant supply of foundry and malleable grades of pig iron approximates 350,000 tons a month. During August and September, the government channeled approximately 50 percent of this supply, or 175,000 tons, into foundries producing items for veterans' housing (bathtubs, radiators, furnaces, fittings, soil and pressure pipe), harvesting equipment, and railroad brake shoes. All other categories of the foundry industry must fight for a share in the remaining 50 percent of this 350,000 tons monthly production.

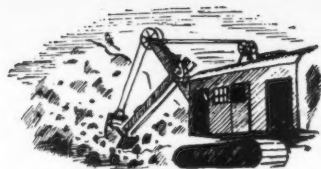
Using the Pittsburgh district as an example, 10 percent of its foundry industry comes within the scope of this order and is obtaining by government direction approximately one half of the merchant supply of pig iron. The remaining 90 percent of the industry in this district will be forced to get along with whatever pig iron they can procure. Pittsburgh is one of the largest industrial areas in the world; its foundries not coming within the scope of this order include such outstanding names as Westinghouse Electric, United Engineering, Blaw Knox, Mesta Machine, Mackintosh-Hemphill, Vulcan Mold, and a great many others. Under this program, these companies will be able to obtain about half of their normal requirements, and gradually the effects of reduced operations will be felt in the various plants. For example, if Westinghouse Electric's foundry closes, it is only a matter of weeks until the entire vast East Pittsburgh Works will be shut down.

To expedite housing for veterans and other citizens who need it is a laudable enterprise. But when in achieving it you manage to do more harm than good it is like the well-intentioned host who invited a man to dinner, took him hunting to shoot the turkey and accidentally shot the guest instead.

*J. H. Van Deventer*



Iron Ore from Hibbing and Ironton, Minnesota



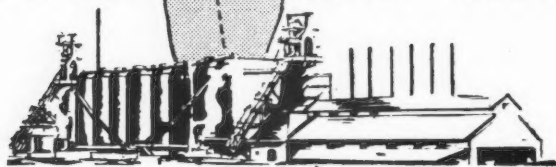
Limestone from Port Inland, Michigan



Iron Ore from Iron River and Ishpeming, Michigan



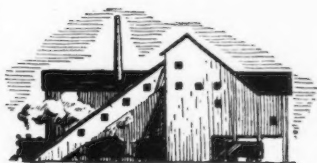
# INLAND...all the way!



Plants at Indiana Harbor and Chicago Heights



Fluorspar from Rosiclare, Illinois



Coal from Wheelwright, Kentucky

The making of steel comprises many elements and processes, among which the gathering of raw materials is of prime importance. The Inland map shows the many points from which we gather these raw materials in the Central States area.

The principal ingredient, iron ore, comes by Inland ore boats from the Mesabi and Cuyuna ranges in Minnesota and the Marquette and Menominee ranges in Michigan.

Port Inland furnishes limestone to serve as flux in the blast furnaces and open hearths. Because a ton of coke is required to make a ton of finished steel products, thousands of tons of coal arrive daily from Wheelwright, Kentucky.

Most significant, however, is the fact that Inland Steel owns the mines and quarries from which these

raw materials are taken...a fact which makes it possible to control quality from the raw materials to the finished steel—ready for use. This complete control from mine to consumer means—that the steel you buy bearing the famous diamond trademark, is... **INLAND ALL THE WAY!**

As with all fabricating materials, the demand for Inland steel now exceeds the supply. However, we are building new mills and expanding facilities that, we sincerely hope, will improve our steel deliveries in the future and eventually enable us to offer you all of the Inland steel you may require.

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- ▶ Jet airliners will be in service on the London-Paris run in 1948, according to British European Airways.
- ▶ Pittsburgh observers believe the nail situation may be cleared up considerably in another 5 to 6 months, particularly if the NHA bonus plan works out as planned. Non-integrated nail manufacturers say that rods are the main obstacle to greater output, and CPA has been trying to locate a few thousand tons a month for them. Mills have been asked to aid in this drive and some rods recently located at the Philadelphia Navy Yard are being shipped to non-integrated mills.
- ▶ Only about 4 pct (\$26 million) of a total surplus of \$624 million has been sold to date by WAA. The proceeds amounted to \$6½ million, or 25¢ on the dollar.
- ▶ It has been learned on good authority that a projected light car program of Chrysler Corp. has also been "interrupted" by the present shortage of raw materials, forgings, castings and the like. Tooling work on the light Dodge is reported to be considerably behind the Ford and Chevrolet programs.

A recent unsuccessful attempt to obtain forging blanks to try out new machine tools is reported to be one of the straws that broke the camel's back as far as light cars are concerned. Despite much searching even a limited supply of forgings for test purposes was unobtainable.

- ▶ The "quit rate" for former servicemen returning to industrial employment is 50 pct higher than that for non-veteran workers. Maj. Gen. Erskine, administrator of the Labor Dept. retraining and reemployment division, made this statement in Chicago, asserting that this figure could be cut if employers put more stress on training and orientation programs and endeavored to use war acquired skills. Meanwhile it appears that more than half a million veterans may use up their \$20 weekly stipend by the end of this year.

- ▶ One of the most distinctive developments in windshield wipers is a special Chinese bridge type blade designed for use on curved glass. Its development stems from work done during the war on wipers for military aircraft.

- ▶ Soviet broadcasters had a field day with the squatters invading luxury apartments in London. One group occupied a building in a quiet London backwater, with the fancy name, "Duchess of Bedford Walk." The USSR radio commentator informed his world that starving and homeless mobs stormed a 1000-room palace belonging to the Duchess of Bedford, driving Her Grace, and servants, before them in headlong flight.

- ▶ English coal mines, short of help, may import labor from Northern Ireland; hundreds of young men there have volunteered for such work.

- ▶ Timken-Detroit Axle Co. is manufacturing light weight heavy-duty truck rear axles having aluminum housing hubs and brakeshoes.

- ▶ Replacing cast vitallium as a bucket material in some commercial turbosuperchargers is 16-25-6 alloy. Buckets machined from cold-rolled rectangular bars of this Timken alloy have properties such as: Yield strength (0.02 pct) — 100,000 psi, tensile strength — 140,000 psi, and elongation — 17 pct, with no heat treatment required after machining. Larger sections of 16-25-6 are now under test for gas turbine applications. (Details on this alloy appeared in The Iron Age Jan. 17 and 24, pp. 44 and 50).

- ▶ An entirely new field for the development of industrial lubricants has been opened up by the recent emphasis on the rust preventive action of turbine oils. There is strong evidence that the increased rate of wear often observed with internal combustion engines under low temperature operating conditions is due to rusting.

One solution to this problem is to employ surface active lubricants which are able to wet metal surfaces, thus forming a protective film and rendering these surfaces water repellent.

- ▶ Through the use of polarographic analysis, small quantities of zinc in aluminum casting heats can be determined within 30 min without the necessity of laborious chemical separations and gravimetric procedures.

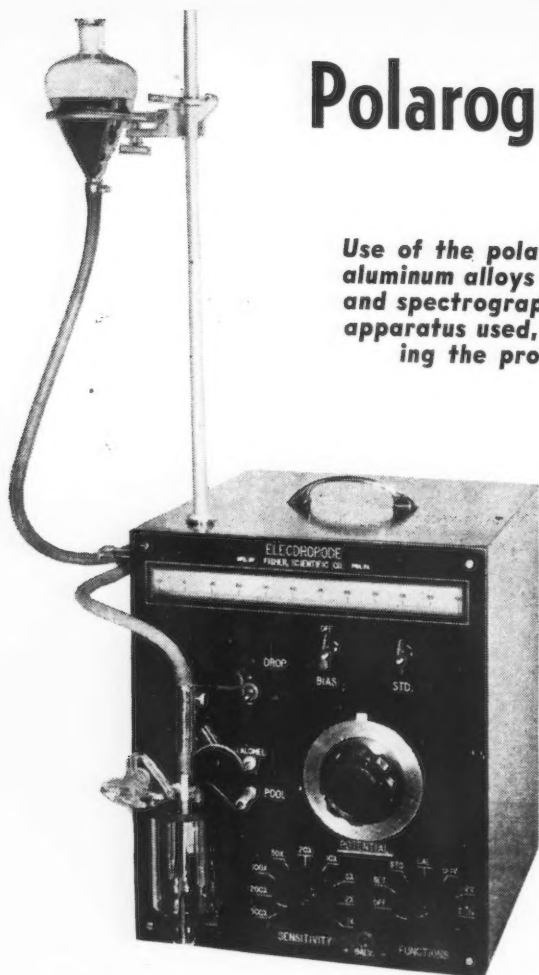
- ▶ One of the industrial results of the war has been the recognition of the economies of permanent mold castings. This increased use of permanent mold castings is well illustrated by the fact that 21 pct by weight of all aluminum casting shipments during 1944 were permanent mold castings.

- ▶ While American automobile production has been badly hobbled by materials shortages and strikes, British auto exports are soaring, according to London sources. Despite prices in the neighborhood of \$1800 British Standard is reported to have sold 200 of its 4-cylinder cars a month in the U. S. A. for the last 6 months. Before the war sales in this country were about ten a year. Imported car prices were decontrolled by OPA last week.



# Polarographic Analysis of Zinc in

*Use of the polarographic method in the quantitative analysis of zinc in aluminum alloys has reduced the analysis time as compared with chemical and spectrographic methods. A detailed description of the materials and apparatus used, is presented, as well as a step-by-step description outlining the procedure to be followed in the mathematical solution.*



**A** FISHER Elecdropode used for polarographic measurements.

**D**URING the past few years there has been an urgent need for a rapid and accurate method for the analysis of low amounts of zinc in aluminum casting heats. The presence of minute quantities of zinc in many aluminum alloys has an appreciable effect on physical properties. The polarographic method which has been developed, can be carried out to completion within 30 min from either a caustic or alkaline medium, eliminating laborious chemical separations and gravimetric procedure. Inasmuch as the chemical analysis of low amounts of

*\*The author is now chief chemist at the Wilbur B. Driver Co., Newark, N. J.*

zinc entails many hours of tedious work, a polarographic method covering ranges 0.00375 to 0.075 pct and 0.075 to 1.51 pct zinc was investigated.

An electrolysis cell is employed in which a pool of mercury is made the anode, and mercury, falling dropwise from a very fine bore capillary glass tube, is made the cathode. A calomel electrode is employed as a reference electrode in this cell arrangement. When solutions, which are either electroreducible or electro-oxidizable, are electrolyzed in this cell, "current-voltage" curves are obtained which are characteristic of the substances being analyzed. Thus, by correctly interpreting these curves both qualitative

and quantitative measurements can be made. In many cases it is possible to simultaneously determine as many as five or six different constituents from a single "current-voltage" curve or polarogram. Fig. 3 represents the simultaneous detection and determination of two ions, lead and zinc. Throughout this paper it will be noted that galvanometer deflections, as ordinate, is substituted for current readings.

## Apparatus and Materials

A Fisher Elecdropode was used for the polarographic measurements which were conducted at room temperature (75° to 80°F). The Galvanometer Index, reading from -10 to +100, is first brought to zero by turning the Functions switch to Set and rotating a knob (on the side of the instrument) not shown in the photograph. The Galvanometer Index is again brought to zero after turning the Functions switch to Std. and the Sensitivity switch to 5X. This procedure standardizes the working battery. For a solution of unknown constituents the Functions switch is set at 0-1V and the Sensitivity at 50X. By rotating the Potential dial and obtaining galvanometer readings for every 0.050-v increase, a "galvanometer deflection-voltage" curve is obtained. When the galvanometer readings reach 100 the Functions switch is set at 1-2V and then at 2-3V. While these readings are taken, a mercury drop-time of from 3 to 4 sec per drop, and a nitrogen atmosphere over the solution is maintained.

Materials used were prepared as follows:

(1) Pilot ions<sup>1</sup>, lead for caustic and cadmium for

<sup>1</sup> E. Forche, *Polarographische Studien*, Leipzig, 1938, *Mikrodiemie*, 25, 217, 1938.

alkaline mediums, were employed to correct for temperature changes and capillary characteristics, and also used as internal standards.

(2) Purified nitrogen gas—oxygen, being reducible at the dropping mercury electrode, was removed from the solution to be tested by bubbling the gas through it for 3 min.

(3) Cadmium chloride C.P.  $\text{CdCl}_2 \cdot 2\frac{1}{2} \text{H}_2\text{O}$ —this solution was prepared so that 1 ml = 0.00130 g cadmium (1.3205 g  $\text{CdCl}_2 \cdot 2\frac{1}{2} \text{H}_2\text{O}$  per 500 ml).

(4) Ammonium chloride C.P. A saturated solution, used as a buffer in the alkaline method was prepared.

(5) Tartaric acid C.P. 50 pct.

(6) Gelatin 0.5 g per 100 ml—the maximum suppressor was prepared by bringing the distilled water

# on Aluminum Alloys

By F. R. DE PAOLA\*

Bendix Aviation Corp., Eclipse-Pioneer Div.,  
Teterboro, N. J.

to a boil, removing from source of heat and then adding the gelatin, stirring to solution.

(7) Sulfuric acid 6N.

(8) Lead nitrate C.P. prepared so that 1 ml = 0.001 g lead (0.7993 g  $\text{Pb}(\text{NO}_3)_2$  per 500 ml).

(9) Ammonium hydroxide C.P.—this reagent was used at full strength.

(10) Sodium hydroxide 20 pct.

(11) Mercury—triple distilled.

(12) Standard alloy—National Bureau of Standards Aluminum Casting 86b containing 1.51 pct zinc was used as a standard in the preparation of the zinc working curves. All tests were conducted with a mercury head of 17 in. and a drop time of 3 sec at 1.0 v against the saturated calomel electrode (S.C.E.). Polarograms

droxide; lead nitrate was found satisfactory. Samples of National Bureau of Standards 86b weighing 0.1000, 0.2000, 0.3000, 0.4000, 0.5000, 1.0000, and 2.0000 g were transferred to 250 ml beakers and each treated with 40 ml of a 20 pct sodium hydroxide solution. They were then boiled until all chemical action ceased, diluted to about 60 ml with distilled water, filtered through No. 41 filter paper, and washed five times with hot water into 200-ml volumetric flasks. Additions of 35 ml tartaric acid, 3 ml gelatin, and 10 ml lead nitrate were then made, the solutions diluted to the 200 ml marks and cooled to 75° to 80°F. Current-voltage measurements were made at 20X sensitivity. Table I represents the data of the measurements taken for the zinc working curve.

For a quantitative polarographic analysis of an unknown aluminum alloy, however, a 2-g sample was taken and the above method used. The only variation was the use of 60 ml instead of 40 ml of 20 pct sodium hydroxide so that a final solution of approximately 1N be obtained.

**Method of Measurement**—Following the usual recording of the current-voltage measurements the increment was determined by using the Increment Method<sup>2</sup>. The difference between two current readings

<sup>2</sup> Dr. Ralph Miller and J. F. Petras, *Polarographische Studien, Leipzig, Mikrodienie* 60, 2990, 1938.

(the increment), one made at a potential slightly below that at which a current increase takes place, and another slightly above that potential, was deter-

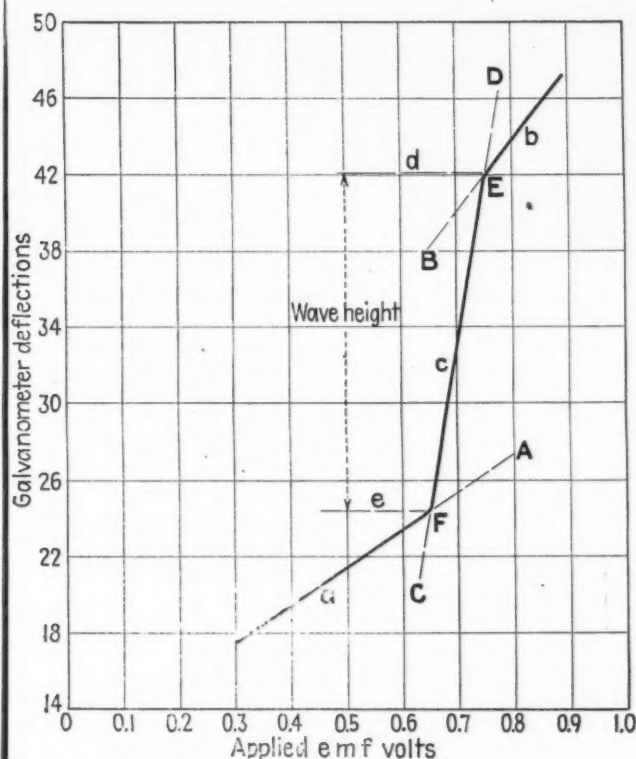


FIG. 1—Method of measurement of cadmium increment.

were taken at full sensitivity for 0.00375 to 0.075 pct zinc range and 1/20 sensitivity for the 0.075 to 1.51 pct zinc range.

(13) Methyl red—0.25 g dye, 150 ml alcohol, and 100 ml  $\text{H}_2\text{O}$ .

## Caustic Medium Method

This method (0.075 to 1.51 pct zinc) necessitated the use of a pilot ion other than cadmium, since the latter is insoluble in the final solution of sodium hy-

FIG. 2—Zinc working curve for range 0.075-1.51 pct zinc.

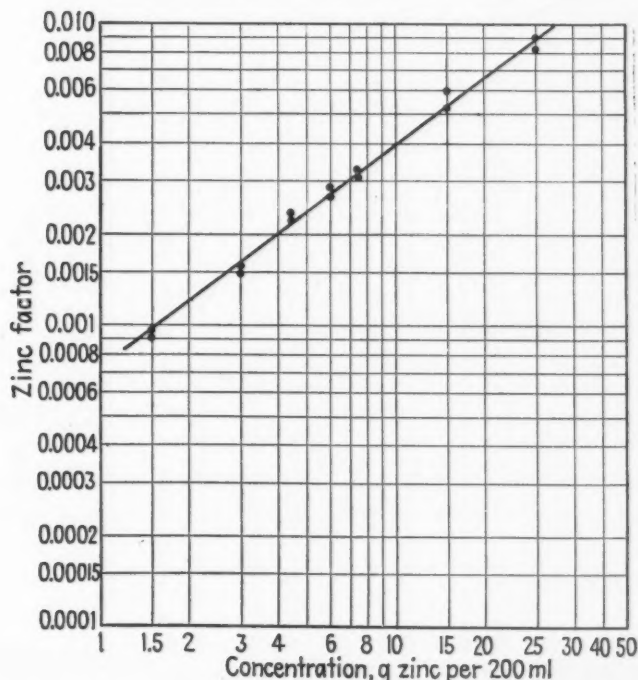


TABLE I Data for the Zinc Working Curve Calibration (0.075 to 1.51 pct zinc)				
86b, G	Zn Current Increments	Pb Current Increments	Zn Concentration, G per 200 ml	Zn Factor
0.1000	2.3	2.4	0.0015	0.00096
	2.4	2.6		0.00092
0.2000	4.6	3.0	0.0030	0.00153
	4.3	2.9		0.00150
0.3000	6.7	2.9	0.0045	0.00231
	6.3	2.9		0.00217
0.4000	8.0	2.9	0.0060	0.00276
	8.1	3.0		0.00270
0.5000	9.6	3.1	0.0075	0.00310
	9.7	3.0		0.00323
1.0000	16.2	2.8	0.0150	0.00580
	16.5	3.0		0.00550
2.0000	22.4	2.5	0.0300	0.00900
	22.4	2.7		0.00830

TABLE II Calibration of Zinc Working Curve (0.00375 to 0.075 pct zinc)				
86b, Ml	Zn Current Increments	Cd Current Increments	Zn Concentration, G per 200 ml	Zn Factor
1	3.2	17.0	0.000075	0.00025
	4.2	17.8		0.00031
2	7.6	19.2	0.000150	0.00052
	7.2	16.0		0.00059
5	12.2	17.2	0.000375	0.00092
	11.0	15.8		0.00091
10	15.0	17.4	0.000750	0.00112
	16.0	17.4		0.00120
15	17.2	16.5	0.001125	0.00138
	17.0	17.0		0.00130
20	19.2	17.2	0.00150	0.00146
	19.0	17.4		0.00142

TABLE III Influence of Tartaric Acid—Pb(NO <sub>3</sub> ) <sub>2</sub> in H <sub>2</sub> O (1.6 mg per ml)		
	Current Increments	
	Without Tartaric Acid	With Tartaric Acid
10 ml	3.7	3.0
	6.2	3.0
	6.3	3.0
20 ml	9.5	6.0
	9.9	6.0
Pb(NO <sub>3</sub> ) <sub>2</sub> , NaOH treated, (1.6 mg per ml)		
	Current Increments	
	Without Tartaric Acid	With Tartaric Acid
10 ml	5.9	3.0
	4.6	3.0
	5.3	3.0
20 ml	8.1	6.0
	9.3	6.0
	10.3	6.0
	8.8	6.0

mined. The standard working curve, however, was prepared from separate graphs of each determination recorded in table I. The height of the zinc or lead increment was measured by the method depicted in fig. 1, as follows: Slopes *a* and *b* were extended to *A* and *B* respectively. Slope *c* was extended to *C* and *D*. Lines *d* and *e* were drawn parallel to the abscissa from the points of intersection *E* and *F*. Wave height, *G*, was then drawn perpendicular to *dE* and *eF*. The zinc factor was then determined by using the relationship:

$$\text{Zn factor} = \frac{\text{Zn increment} \times \text{Cd conc}}{\text{Cd increment}}$$

The working curve was then prepared by plotting the zinc factor as ordinate and concentration as abscissa on log-log paper, as shown in fig. 2. Duplicate readings were recorded for each determination. Fig. 3 illustrates a typical lead-zinc polarogram where galvanometer deflections are recorded as ordinates and applied emf (volts) as abscissae.

#### Alkaline Medium Method

In this method, (0.00375 to 0.075 pct zinc) a 1.0000 g sample of National Bureau of Standards Aluminum Alloy Casting drillings 86b was transferred to a 250-ml beaker. Forty ml of 10 pct sodium hydroxide solution were added and boiled until all chemical action ceased. It was then removed from the heat and diluted to about 60 ml, filtered through No. 41 filter paper, and washed five times with hot water into a 400 ml beaker. The solution was made acid by the addition of 6N sulfuric acid and the solution heated if a precipitate was formed. The clear solution was then transferred to a 200 ml volumetric flask and diluted to the mark. Six aliquots were taken, namely, 1, 2, 5, 10, 15, and 20 ml and each transferred to a 200 ml volumetric flask. Five ml of saturated ammonium chloride solution, 5 ml of a 50 pct tartaric acid solution and 1 ml cadmium chloride solution were added to each flask (35 to 40 ml tartaric acid solution were used if the aluminum sample taken exceeded 0.5000 g). For routine work a 2 g aluminum alloy sample and 35 to 40 ml 50 pct tartaric acid were used instead. The solutions were made alkaline to methyl red with ammonium hydroxide and 10 ml excess were added and the solutions diluted to the mark. Prior to recording of the polarograms, the solutions were cooled in a water bath to a temperature of 75° to 80°F. Table II represents the data obtained for the zinc calibration curve with the range 0.00375 to 0.075 pct zinc, and fig. 4 represents the working curve for zinc by plotting zinc concentrations as ordinates and zinc factors as abscissae on semi-log graph paper.

Following through one of the spectrographically analyzed aluminum alloys, SAE 345, the steps in the final calculation were noted for those readers who are not too well acquainted with the method. As the applied electromotive force was increased, corresponding

TABLE IV Comparison of Spectrographic and Polarographic results		
SAE	Spectrographic	Polarographic
323	0.01	0.009
38B	0.05	0.052
38A	0.02	0.023
345	0.06	0.058



galvanometer deflections were observed and recorded directly on the prepared graph paper. At about 1.7 v, recording of the data was discontinued. The graph was then drawn and the cadmium and zinc increments were determined as shown in fig. 1. By substituting the values of the cadmium increment, zinc increment and cadmium concentration in the formula presented under "Method of Measurement," the zinc factor was obtained. The value of the zinc increment was found to be 7.9, that of cadmium 17, and that of cadmium concentration 0.0013 g per 200 ml of solution. Substituting,

$$\text{Zinc factor} = \frac{7.9 \times 0.0013}{17} = 0.000604$$

This result was then multiplied by 100,000 to yield a zinc factor of 60.4. From fig. 4, this reading of 60.4 finally yielded a zinc concentration of 0.000180 g zinc per 200 ml of solution. Since the graph was based on a 200-ml solution sample, the zinc concentration obtained was multiplied by 100 and divided by the sample weight, 2 g. The zinc content was, therefore found to be 0.009 pct.

### Discussion of Results

In the caustic medium method, tartaric acid was used to offset the inconsistent readings obtained for lead. While the zinc increments were satisfactory and consistent, the lead increments for the various solutions were found to be erratic. It was also observed that prior to the recording of the "current-voltage" curves a brown precipitate of iron hydroxide was formed. Consequently, the addition of 35 ml of a 50 pct tartaric acid solution which tied up the iron to form an iron complex, was used. The data of the investigation in reference to the use and omission of tartaric acid in a water and caustic medium is represented in table III.

It was also noted that although the concentration of lead, 0.001 g per ml, throughout the preparation of the calibration curve was greater than that of zinc,

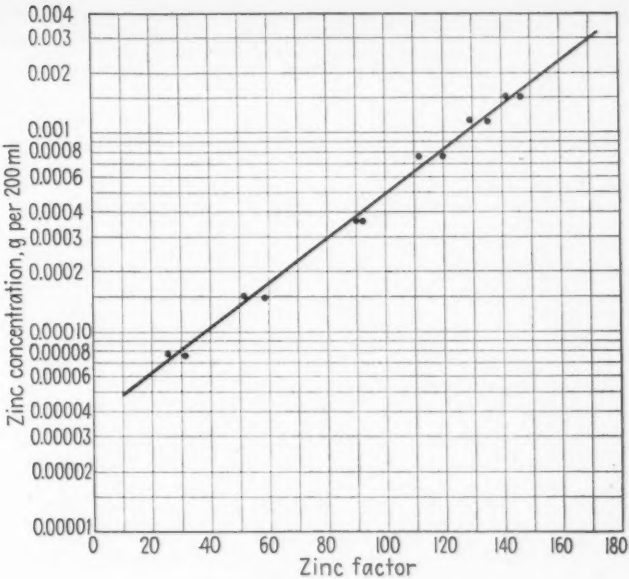


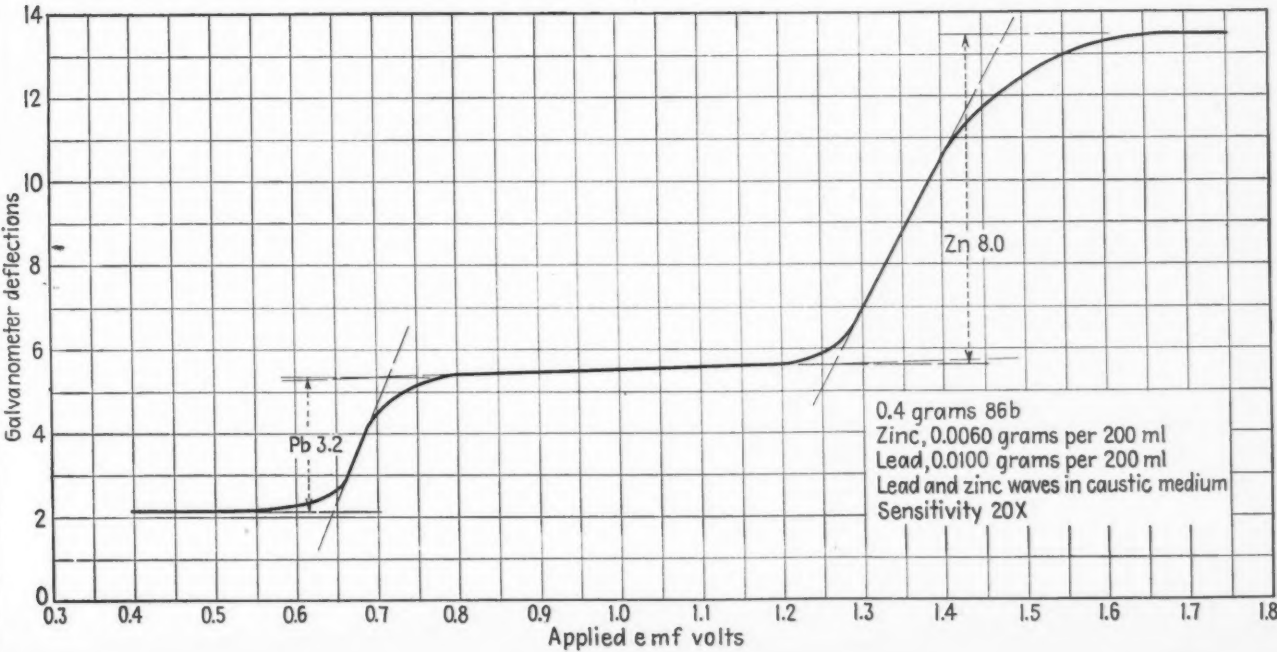
FIG. 4—Zinc working curve for range 0.00375-0.075 pct zinc.

the lead diffusion current was smaller. In a caustic medium, tartaric acid appeared to suppress the height of the lead wave.

The caustic and alkaline medium methods depend upon the solubility of zinc in sodium hydroxide. Experiments have shown that 99.9 pct zinc is retained in the caustic solution since the insoluble residue was found to be almost spectrographically free of zinc. The very small amount of zinc occluding to the residue did not noticeably influence results for laboratory routine work.

Although cadmium current increments in the alkaline medium method were not of the same height, the cadmium concentrations remained the same throughout the experiment. Consequently, any changes affect-

FIG. 3—Typical lead-zinc polarogram.



ing the pilot ion affected the sought ion, and therefore, the ratio between the two ions, cadmium and zinc, remained satisfactory for all subsequent determinations.

For routine analysis (alkaline medium method), 2-g samples of aluminum alloys SAE 323, 38B, 38A, and 345 were transferred to 250 ml beakers and dissolved in 40 ml of 20 pct sodium hydroxide solution. After all chemical action ceased, each was diluted to about 60 ml, filtered through No. 41 paper, and washed five times with hot water into 400-ml beakers and the filtrates acidified with 6N sulfuric acid. Since a large amount of precipitate was formed, low heat and addi-

tional dilute sulfuric acid were used to effect solution. Thirty five ml tartaric acid and 1 ml cadmium chloride solution were added to the filtrates and transferred to 200-ml volumetric flasks. The solutions were made alkaline to methyl red with ammonium hydroxide and 5 ml excess added. Finally, 3 ml gelatin solution were added and the solutions diluted to the marks. After cooling to 75° to 80°F the polarograms were taken at full sensitivity (1X). If ever a precipitate of aluminum hydroxide was observed upon standing of the final solution it was disregarded, as the zinc analysis was not affected.

## Effect of Surface Scratches on Alclad Sheet

**S**URFACE scratches frequently result from the handling of aluminum alloy sheet and parts in the shop, and the effect of these on the strength of aircraft and other highly stressed parts has been the cause of some concern. In addition, these scratches have been considered to be a cause of many failures in forming. Since little data on the quantitative effect of surface scratches on the strength and formability of aluminum alloy sheet were available, a series of tests were undertaken by Lockheed Aircraft Corp.

The material used was 0.064-in. thick 24S-T sheet, and test scratches were made with a V shaped cutting tool having a 90° included angle and a nose radius of 0.001 in. Scratch depth was carefully controlled to an accuracy of  $\pm 0.0003$  in.

Tests indicate that scratches that do not penetrate the core material have no effect on the mechanical properties or forming characteristics of the material. Considerable pressure is required on a sharp instrument to produce a surface scratch deep enough to penetrate through the cladding and into the core material, but even when this occurs, the yield stress is not affected by scratches as deep as 0.010 in. into the core. The ultimate strength and ductility, however, are both reduced by such scratches, this reduction being proportional to the depth of the scratch. The orientation of the scratch relative to the direction of principal stress has been found to have a definite bearing on both the mechanical properties and the forming characteristics.

The use of lightly scratched material should therefore be considered permissible for lightly stressed parts, provided there is no objection from the point of view of appearance. Parts which involve severe forming, however, should not be attempted with scratches deeper than the cladding that coincide with regions of large plastic strains. Forming failures may occur under such conditions.

Burnishing of aluminum sheet does not remove these scratches, and hence cannot remove their effects. In the burnishing operation, the surface scratch is merely filled with the soft aluminum cladding material displaced from the surface of the sheet adjacent to the scratch. This action obviously leaves the scratch intact insofar as its effect on the strength and ductility of the sheet are concerned. Burnishing may actually be harmful, therefore, since it may result in the obliteration of the visual indications of harmful defects.

Since the decision as to whether or not to accept scratched material or parts must rest with the inspection department, Lockheed prepared a series of standard scratch specimens for comparison purposes.

Each set consisted of five different gages of 24S Alclad sheet, each containing three scratches with controlled depths equal to  $\frac{1}{2}$ , 1, and  $1\frac{1}{2}$  times the cladding thickness.

Results obtained in simple tension tests are shown in table 1. Specimens containing surface scratches ranging in depth from 0.0016 in. to 0.0126 in. were pulled to failure. In each case the scratches were located in the center of the 2 in. gage length and were oriented normal to the principal stress axis. For measurement of the strain distribution, 0.01 in. square photogrids were employed on the surface of the specimens, and the tests indicated that strain distribution was not affected by scratches which did not penetrate below the cladding. Decrease in elongation over any gage length was found to be proportional to the depth of penetration into the core material.

A similar investigation was undertaken on 75S-T Alclad, 0.064 in. thick, and yielded entirely different results. With this material it was found that a surface scratch, equal in depth to one half the cladding thickness, had a small but very definite effect on the strain distribution, ductility, and formability in bending, while those scratches which penetrated the core material had a very large effect on the mechanical properties and forming characteristics. Yield strength on this

TABLE I

Tensile Test Data for Scratches in 24S-T Alclad, 0.064 in. Thick. Average for Two Specimens of Identical Scratch Depth

Scratch Depth (in.)	Yield Stress (psi)	Ultimate Stress (psi)	Reduction of Area (pct)
0.0000	52,600	69,900	33.1
0.0016	50,150	70,450	33.0
0.0043	49,550	57,750	18.0
0.0078	49,050	55,850	15.5
0.0126	49,400	49,400	14.4

material does not appear to be affected by scratches as deep as 0.010 in. into the core material, although the ultimate strength is affected slightly by scratches which do not even penetrate the cladding.

Tests on both types of material were limited to a single scratch made on each specimen with a V shaped tool, and all scratches were oriented normal to the direction of the rolling grain. The axis of principal stress of all specimens was parallel to the rolling grain, and normal to the surface scratch. Bend test specimens were formed to a 90° bend with the scratch located on the tension side of the bend and parallel to the bend axis.



# Semiquantitative Tests for Moly in Steel

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MODIFICATIONS to the thiocyanate and the potassium ethylxanthate methods for detecting and roughly estimating the molybdenum content in steels and irons are presented here. The procedure outlined by Jones<sup>1</sup> is modified chiefly by the use of butyl acetate to extract and concentrate the colored compound and by the use of a more concentrated solution of stannous chloride to delay the reoxidation of iron and formation of the red thiocyanate iron

complex, upon standing. Since drops vary in size with the diameter of the orifice of pipettes or droppers, it was thought desirable to standardize the drops, (L) being used for drops of 20 to the ml and (S) for drops of 30 per ml. Ammonium thiocyanate can be used in place of the sodium salt. Analysis of the samples and results obtained may be found in table I. The procedure is given below.

### Thiocyanate Method

A small strip of filter paper is placed on a clean surface of the sample, and 2 drops (L) 1:1 nitric acid added on the filter paper. After reacting for about 1 min the filter paper is rolled onto a glass stirring rod and transferred to a clean test tube. Three milliliters 72 pct perchloric acid is added to the test tube and agitated. Then 5 ml distilled water is added and the test tube is again agitated until the filter paper is completely dissolved. A drop (S) of sodium thiocyanate solution (5 g per 100 ml water) is added to the tube and shaken until a deep red color develops. Five drops (S) stannous chloride solution (10 g per 25 ml conc HCl is added, shaken for about 30 sec, 3 more drops (S) of the same solution added and again shaken. An addition of 5 drops (S) of the sodium thiocyanate solution is made and the contents agitated for 30 sec. Finally, 2 ml butyl acetate are added, agitated well, and layers allowed to form. Note color of the butyl acetate extract. Time for test is 5 min; for 6 tests, 18 min.

### Ethylxanthate Methods

Method A. Mark off on clean metal a circle of about

1 cm (2.5 in.) diam with the edge of a piece of paraffin. Place a drop (L) of conc HCl and 2 drops (L) 6N HNO<sub>3</sub> on the confined area. When action has ceased (about 2 min), transfer a drop (S) of the steel solution to a spot plate depression. Now add 4 drops (S) 72 pct perchloric acid. After action has ceased, add 3 drops (L) 6N NaOH. Solution now must be alkaline. Transfer a drop (S) of the alkaline solution to a double thickness of S & S No. 589 filter paper. To the filtered spot add 1 drop (L) 6N HCl and 1 drop (S) of a freshly prepared saturated solution of potassium ethylxanthate. Note color, which disappears upon standing. Time for test is 4 min; for 6 tests, 14 min.

Method B. To acid solution prepared as in Method A with HCl and nitric acid, add 3 drops (S) water and sprinkle a small amount of sodium peroxide on the solution. After action has ceased, add 10 drops (S) or 7 drops (L) of water and stir. Solution must be alkaline. Transfer a drop (S) to a double thickness of S & S No. 589 filter paper and proceed as in Method A. Time for test is 3.5 min; for 6 tests, 12.5 min.

S & S filter paper No. 601 (special for spot tests) may be substituted for the No. 589, in which case a single thickness is used, the HCl and potassium ethylxanthate being added to the underside of the paper. This paper has the advantage of keeping the spots small with even distribution of color.

The results in table I show that by noting the intensity of the orange color of the butyl acetate extract obtained in the thiocyanate method, the approximate

The authors are indebted to Alten's Foundry & Machine Works, Lancaster, Ohio, for suggesting this work and the grant for financing it.

percentage of molybdenum up to 0.5 pct can be determined. For estimations above that percentage, semiquantitative results may be obtained by using only 1 drop of nitric acid. It also is shown that the procedures with potassium ethylxanthate give negative results up to about 0.2 pct Mo and that quantitative differentiation between 0.5 and 0.9 pct Mo is possible. All attempts to develop a more simple test have failed so far.

TABLE I  
Determination of Molybdenum Content By Color

Sample No.	Type AISI	C	Mn	P	S	Si	Cr	Ni	Cu	V	Mo	Color, Thiocyanate Method	Color, Ethylxanthate Methods	
													Method A	Method B
1	3313	0.12	0.45	0.013	0.021	0.27	1.53	4.00	0.09	....	0.03	colorless	colorless	colorless
2	9435	0.35	1.00	0.020	0.017	0.30	0.37	0.37	0.08	....	0.10	faint orange	colorless	colorless
3	8620	0.20	0.89	0.019	0.021	0.24	0.54	0.51	0.09	....	0.20	weak orange	colorless	colorless
4	1365 Mod.	0.64	1.72	0.013	0.018	0.24	0.13	0.09	0.07	....	0.35	moderate orange	weak pink	moderate pink
5	4143 Mod.	0.44	0.53	0.013	0.017	0.64	1.28	0.18	0.07	0.23	0.52	strong orange	weak pink	moderate pink
6	2 Cr-1 Mo	0.16	0.39	0.011	0.013	0.33	2.24	....	....	....	0.90	very strong orange	strong pink	strong pink
6	(using only 1 drop of nitric acid)	....	....	....	....	....	....	....	....	....	0.90	strong orange	....	....
X	(iron sample)	....	....	....	....	....	....	....	....	....	0.30	moderate orange	weak pink	moderate pink



# Permanent M

Advantages offered by the permanent mold casting process are discussed in this article from the consumer's viewpoint. Advantages of superior physical properties, uniformity and economy are examined, together with certain disadvantages, and information is presented on points to be considered in designing parts to be produced by this method.



FIG. 1—Idler pulleys and an electric saw handle are typical permanent mold castings. Note the smooth uniform finish on the inside diameter of the pulleys on which no machining is required. The handle requires only polishing and buffing.

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**S**ELECTING one casting process to cast every part, regardless of shape or design, or of the function and service requirement of the part, was for years the accepted method of buying aluminum castings. This is radically changed today. Increased competition, higher manufacturing costs, the need for increased production to partially offset rising costs, have contributed to a re-evaluation of the various casting processes, in the hope of substituting one process for one promising increased production and lower manufacturing costs without sacrificing serviceability of the finished part. While only a specific application determines the beneficial use of permanent mold castings, the late war years brought to the surface so many economical applications of permanent mold castings that it is generally agreed that from an economy and production standpoint, permanent mold castings are worthy of close scrutiny by manufacturing executives. In 1944 alone 106,000,000 lb of permanent mold castings were shipped. This represents 21 pct by weight, of all aluminum casting shipments during that year.

Permanent mold castings present many advantages: A higher strength and closer structural density are obtainable; machining costs are reduced; and on many parts the final cost per piece is lower than that obtainable with other forms of casting processes. Naturally, the quantity has an important bearing on the final cost per piece.

For further information on this subject see "Aluminum Permanent Mold Castings," *THE IRON AGE*, April 23, 1942, and "Light Metal Permanent Mold Castings," Dec. 28, 1944.

Table 1 shows the relative advantages and disadvantages of the various casting processes. The immediate and most important advantages of permanent mold castings are discussed later in this article. Proc-

esses are rated from 1 to 4, with 1 representing the most advantageous. The table is limited to an analysis of castings having the same or similar design, and to those made without cores. Castings are considered in the as-cast condition.

Due to the chill effect of the metal mold, causing a grain refinement of the poured metal, permanent mold castings possess greater strength, which can be further increased by heat treating. On test bars permanent mold castings show a 10 to 15 pct increase in desirable physical properties. The desirability of high strength is particularly important in parts possessing lighter weight sections. A lower factor of safety can thus be considered when designing for permanent mold casting.

A much smoother finish is obtainable with permanent mold castings, enabling a manufacturer to chart his machining and finishing costs, often impossible with castings from other processes where the finish may fluctuate from smooth to coarse, thus making an honest and exact analysis of machining costs well in advance of the actual machining operation exceedingly hazardous. Because there is little excess metal on the average permanent mold casting, only a limited amount of stock is removed by machining. This can add up to a sizeable saving. Frequently the finish is smooth enough to enable a manufacturer to forego a machining operation. An example of this is found in fig. 1. The round idler pulleys used at the Porter-Cable Machine Co. were previously sand cast, and necessitated an additional cleaning operation on the inside of the pulleys. When these parts were permanent mold cast, this inside cleaning operation was eliminated. Another advantage of permanent mold castings, in the finishing department, lies in the speed with which they are polished and buffed. The saw

# Permanent Mold Castings Offer Production Economies

handle, fig. 1, is a case in point. The handle, after parting lines are removed, is polished on an abrasive belt and then buffed on a regular buffing jack. The manufacturer doubled production on this polishing operation, at the same time achieving a fine, mirror-like finish.

It is impossible to estimate the cost of casting parts by the permanent mold method in relation to cost of casting by other methods. The design of the part, its intricacies; need for, or absence of, coring; quantity desired; and the subsequent machining necessary to finish the part to desired specifications, play their part and exert an influence on the final cost per piece. It can be safely said, however, that the following savings are realized: Once the tools are made, large runs are possible without costly and periodical replacements; the quality is constant; close accuracy exerts a sharp influence in lowering scrap losses. These latter are reduced to a minimum, and once established as a basis,

will not vary. With less metal to remove, machining and polishing time is reduced. It may be said that permanent mold castings are the most economical method of casting for rapid production of high strength quality castings possessing a fine surface and requiring a minimum of machining.

In connection with the cost of permanent mold castings the figures shown in table II may prove of interest. These refer to the large idler pulley shown top right in fig. 1, and to the smaller pulley shown next to this. The figures are not given to prove the economical advantage of permanent mold castings, for many users can point to more impressive savings, but are included to show that permanent mold castings can be substituted for other types of castings with some economical benefit.

## Casting Process

Permanent mold casting consists of hand pouring the molten alloy into metal molds which are so constructed that the metal flows into every crevice and recess of the mold. Gating and feeding is of utmost importance in permanent mold casting. The flow of metal must be of such a nature that the solidification rate is equalized and progressive. Neglect in design, especially in the design of thicknesses and gating, can cause nonuniform solidification which may lead to shrinkage or cracking. The general design of the mold, location of cores, position and size of vents and chills, wall thicknesses and other design and casting considerations influence the rate of solidification and



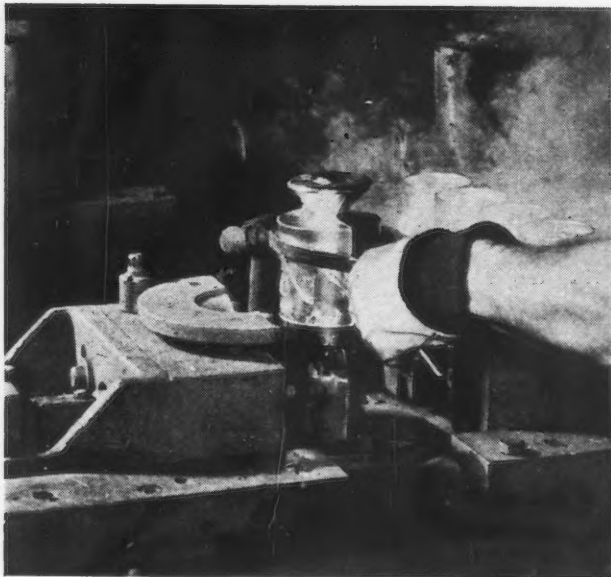
ABOVE

**FIG. 2**—The permanent mold is tightly closed by hydraulic pressure while the metal is poured from a hand ladle. The parts being cast are pistons.



RIGHT

**FIG. 3**—View of the open mold after solidification. The metal solidifies quickly, and pouring and ejecting of the finished casting requires only seconds.



**FIG. 4**—The finished casting is removed with a pair of tongs. A solid core, seen just below the part, is used to core out the inside. The funnel-shaped riser is later removed and remelted.

must be approached with caution and correct understanding.

Molds generally consist of two or more parts mounted on a base plate. To facilitate removal of the casting from the part, hinges, tracks, or guide rails are provided. After pouring and solidification, the mold is opened and the finished casting removed. Closing and opening the mold can be operated either by hand or automatically. Figs. 2 to 4 inclusive show the casting of aluminum pistons at the Sterling

Aluminum Products Co., who were among the pioneers in adapting permanent mold castings to the automotive industry.

The shapes which are cast by the permanent mold process are infinite. They range from the simplest flat disc type to complicated parts containing numerous recesses and cavities, requiring split cores, multiple piece molds or sand cores. Fig. 6 shows a permanent mold agitator, cast for the Easy Washing Machine Co. The range in shapes can be appreciated when this agitator is compared to the relatively simple idler pulleys in fig. 1. Applications of permanent mold castings are found in every field of manufacture: Automotive, aircraft, machines, component parts for service items and many others. Some of these parts weigh in excess of 100 lb. Small typewriter parts, weighing no more than a few ounces, are also cast successfully. In determining the sizes which can be permanent mold cast, the number of parts desired and the intricacy of the part are controlling factors. From a standpoint of size, and not intricacy, cylindrical parts, measuring 3 to 4 ft in diameter, have been economically cast. Except for unusually complex design, the majority of castings now sand cast can be permanent mold cast. When, however, the parts are so intricate that the mold cannot easily be opened after solidification of the metal, they are not adaptable to the permanent mold process. If the casting is too large the cost of the mold tends to be prohibitive, and unless the quantity and the quality desired are such that the benefits from permanent mold castings outweigh the cost of the mold, it is better to cast the part by another process.

### Design Suggestions

The success or failure to produce parts economically by the permanent mold method depends primarily upon the designer, working in close collaboration with permanent mold engineers and metallurgists. The peculiarities inherent in the process sometimes make it necessary to slightly alter the design of a part if all the advantageous physical properties possible with permanent mold castings are to be realized. The design of the part usually determines the rate of production, the manufacturing costs and other costs and economies.

There is nothing particularly difficult about designing for permanent mold castings. A knowledge of other casting processes, with an understanding of molds, enabling the designer to appreciate the problems of the mold designer, are of importance. It is easy to run into needless costs, which a few simple design alterations would eliminate.

Wherever possible, sections should be uniform. The gating and feeding problem is thus simplified, and closer control over the rate of solidification is possible. The danger of internal strains, present when thicknesses change frequently, is overcome by exercising caution over the design of sectional thicknesses. When a thin section joins with a heavy section it is good practice to gradually increase the thickness of the thinner section as it approaches the point of junction with the thick section.

Sections for permanent mold castings vary greatly. Generally 1/8 in. is the lightest section which can be cast economically, although certain conditions exist under which lighter sections are successfully produced, but their accepted use is restricted by the intricacy, shape, weight, size and service function of the part.

Advantage	High Pressure Die Castings	Permanent Mold Castings	Plaster of Paris Castings	Sand Castings
Speed of production.....	1	2	4	3
Flexibility of design.....	2	2	1	1
Surface.....	2	3	1	4
Speed of getting into production.....	3	3	2	1
Pressure tightness (after machining).....	4	1	2	3
Thickness of section.....	2	3	1	4
Structural density.....	4	1	2	3
Flexibility as to alloys.....	4	2	3	1
Casting stresses.....	4	3	1	2
Strength.....	3	1	4	2
Pattern or mold cost.....	4	3	2	1
Limitation size.....	3	2	4	1
Cost per piece.....	1	2	4	3
Tolerances.....	1	2	1	3
Reproducibility of successive castings.....	1	1	1	2

	Sand Casting \$	Permanent Mold Casting \$	Sand Casting Machining, Hr	Permanent Mold Casting Machining, Hr
Large Idler Pulley.....	0.50	0.46	0.63	0.57
Small Idler Pulley.....	0.15	0.13	0.19	0.15



A part with thin ribs, especially if the ribs are highly stressed, should be designed with care, bearing in mind that the limiting factors of thickness apply even more forcefully when dealing with ribs. The rate of flow, and rate of cooling of the metal in the mold can be carefully controlled so that stresses are not set up.

Closer tolerances can be held with permanent mold casting than can be held with sand castings, although die castings and plaster castings have the tolerance edge over permanent mold castings. The minimum diameter of cored holes should be about  $\frac{3}{8}$  in. although sometimes  $\frac{1}{4}$  in. can be cored successfully. Undercuts should be avoided because they require more movable parts in the mold, with attendant parting lines. Undercuts also require multiple piece cores, all adding up to increased cost.

A part requiring no cores, or a minimum of cores, lends itself to mass production by the permanent mold process better than a part composed of multiple cores. As the number of cores in the mold is reduced, the production speed increases. Cores, excepting solid ones, must be replaced in the mold after each casting, hence, if at all possible, it is advisable to use a solid core. Even if the design must be altered to do this, the resulting saving in production time and the reduced manufacturing costs will be substantial. The mold used at the Sterling Aluminum Products Co., fig. 4, shows a solid core. In this series of photographs, the mold, as well as the core are of a special, patented design.

Fillets at all angles help to prevent shrinkage and cracking. Because sharp angles constitute a source of weakness in any casting, whenever cross ribs join a supporting thickness fillets should be provided.

The minimum draft angle on the outside should be about  $2^\circ$  on each side. On some parts  $3^\circ$  are necessary, while on other parts less draft may be acceptable. However, each design has its own characteristics influencing not only draft angles, but undercuts, and providing its own rules to assure better castings. The design engineer should work at all times with a quali-



FIG. 5—Inside and outside views of a permanent mold cast washing machine agitator. Despite its unusual shape this job is well adapted to the permanent mold process.

fied permanent mold casting engineer so that restrictive influences can be removed by correct designing.

Practically all of the high strength aluminum alloys can be used for permanent mold castings. The design and the service condition which the part must meet have an important bearing on the alloys selected. During the war, when the availability of pure metals posed a problem in supply and demand, many permanent mold manufacturers used metals from remelt sources with distinguished success. In many manufacturing plants today it is optional whether pure metals or metals from remelt sources are used. Naturally, there is a slight saving if metal from remelt sources is used.

## New Books

*"Die Casting."* Bound bibliography of more than 1200 references on die casting. The publication is broken down into sections covering alloys, design, applications and process technique. Die casting, 1240 Ontario Street, Cleveland 13, \$7.50.

\* \* \*

*"Collected Abstracts on Spectrochemical Analysis,"* compiled by E. S. Hodge. Some 80 abstracts of articles dealing with spectrochemical analysis published in 1945 in Chemical Abstracts, collected in soft cover booklet. Topical and author index are included. Ohio Valley Spectrographic Society, Engineers' Club Bldg., Dayton, 64 p., \$1.25.

\* \* \*

*"Scientific Instruments,"* by Herbert J. Cooper. Written in fairly simple language, this book discusses and illustrates a wide range of instruments for making physical measurements. The five basic sections of the book cover optical instruments, measuring instruments, navigational and surveying instruments, liquid testing and miscellaneous. Chemical Publishing Co., Inc., 26 Court St., Brooklyn 2, 304 p., \$6.

*"Safety Directory."* First edition of product directory giving extensive information on more than 1000 products used in safety, first aid, hygiene, health conservation and fire protection. Volume is cross-indexed and has a topical index. Alfred M. Best Co., Inc., 75 Fulton St., New York, 351 p., \$5.

\* \* \*

*"How to Conduct Conferences,"* by A. M. Cooper. Discusses effective techniques of leading conference discussions with various types of groups on any subject. Development of workable conference plan is outlined and considerable text space is devoted to conducting labor-relations conferences. McGraw-Hill Book Co., Inc., 330 W. 42nd St., New York 18, 207 p., \$2.

\* \* \*

*"Finishing Metal Products,"* by H. S. Simonds and A. Bregman. Treats of the finishing of metals from a broad point of view and points out means of producing more attractive finishes and more efficient means of producing them. Cleaning and descaling processes are covered as are the commercial sales value of various finishes and effect of color. A section is devoted to estimating electroplating costs. McGraw-Hill Book Co., 330 West 42nd St., New York 18, 352 p., \$4.



An expensive ball bearing completely ruined by corrosion induced by water and gasket material.

WHILE the chief function of a lubricating oil is lubrication, it must also act in several other capacities, as a coolant, a sealing agent, a scavenger, a transmitter of power, and as a protector of the machinery in which it is being used, i.e. it should prevent rusting and wear caused by rusting.

The ability of lubricating oil to adhere tenaciously and thus protect metal surfaces is probably its most important and at the same time its least understood property. It is the purpose of this article to point out the significance of this property and its relationship to the various functions of a good lubricant. While there is a vague recognition of differences in performance of various oils in this respect, there does not exist a sufficiently descriptive and generally accepted term to name this phenomenon. Such expressions as oiliness, lubricity, wetting of or plating on metal surfaces are extremely difficult to define.

This article is limited to the protective action of certain surface active industrial lubricants and does not concern itself with film type rust preventive oils which are not primarily intended to act in a lubricating capacity.

Lubricating oil can be regarded as being composed of an inert vehicle and of active ingredients which either occur naturally or are added. This inert vehicle represents the bulk of the oil and its main function is that of a coolant and a carrier of the active ingredients. As a lubricant it is only useful in fluid film lubrication where no metal to metal contact occurs; its surface activity<sup>1, 2</sup> is negligible. Proper selection of the crude oil and of the refining processes are, however, highly important in determining the basic oxidation stability of an oil and its susceptibility<sup>3</sup> to antioxidants, either naturally occurring or added. The resistance to oxidation of a lubricant is important,

## Protective Value Of Industrial Lubricants

**A vital function of a lubricating oil is to adhere to metal surfaces in such a manner as to exclude moisture and prevent corrosion. The significance of this property and its relationship to the various actions of a good lubricant are analyzed. The author cites an example wherein the scientific application of a lubricant eliminated excessive shut downs due to rusting of gears in high speed machine tools.**

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since this helps to insure retention of initial properties including surface activity, during use.

Surface active compounds to be effective must have a water soluble (hydrophilic) portion in their molecule and also a water insoluble (hydrophobic) portion. Further, these two portions must be properly balanced. The hydrophilic portion is attracted by water while the hydrophobic (hydrocarbon) portion is kept in the oil phase. Such compounds, particularly those containing oxygen (carboxyl or hydroxyl groups, etc.) will readily orient themselves at an oil water interface thus reducing the interfacial tension<sup>4</sup> (ift). In this way even minute quantities of these compounds can be detected.

Highly treated hydrocarbon oils such as medicinal white oil, have ift's in excess of 50 dynes per cm while for most uncompounded lubricants this value is

*This article is an extended abstract of a paper presented at the 1946 national convention of the American Society of Lubrication Engineers.—Ed.*

between 30 and 40 when new, and often as low as 10 or even lower when used. It is a matter of common knowledge that medicinal type white oils are poor lubricants. It has been shown<sup>5, 6</sup> that mineral lubricating oils form compounds on oxidation which are hydrophilic and which exhibit strong affinity for metal surfaces, and that in the early stages of the normal



oxidative deterioration the lubricity of a refined oil may actually improve.

It might appear that the ift could be used as a measure of the surface activity of lubricants. Unfortunately, however, this is not the case. There are many surfaced active compounds which nevertheless are undesirable as lubricants since they depreciate oil performance in service.

The question may also be asked why surface active compounds which orient themselves at the oil-water interface, should necessarily do the same at the oil-metal interface. Without going into the theoretical details, it is known that even a freshly prepared metal surface is instantly covered by at least a monomolecular layer of metal oxide. Experience has shown that metal oxides are more readily wetted by water than by oil, that is, they are hydrophilic. For example, if a freshly polished steel specimen is immersed in white oil free of surface active constituents, and a drop of pure distilled water is then placed on the specimen, the water displaces the oil and soon rusting sets in. It may be argued, however, that water is heavier than oil and the displacement is due to a difference in gravity. But, when the above experiment is repeated using the equipment of the ASTM turbine oil rusting test (D-665-44T) where a 1/2-in. diam polished steel rod is suspended in oil and after stirring for 30 min at 140°F, 10 pct distilled water is added, the rod will soon be covered with water droplets and rusting will begin within a short time. In a similar way it may be demonstrated that oils containing surface active constituents will prevent adherence of water to the steel specimen and either entirely prevent or considerably minimize rusting.

Again there may be a temptation to accept the ASTM rusting test as a measure of surface activity for an oil. However, some of the most surface active oils will perform poorly in service (they may cause oil deterioration resulting in the formation of sludge) and even result in an increased rate of rusting. This type of rusting may be due either to hydrolysis or to oxidation of oil additives. Metallic or nonmetallic soaps often used as rust preventives have a tendency to hydrolyze upon continued exposure to the action of moisture and their surface activity is lost. Certain oil-additives are also oxidation unstable and may thereby turn water soluble and/or procorrosive, that is, promote rusting. Apparently mere surface activity does not assure protection of metal surfaces in service.

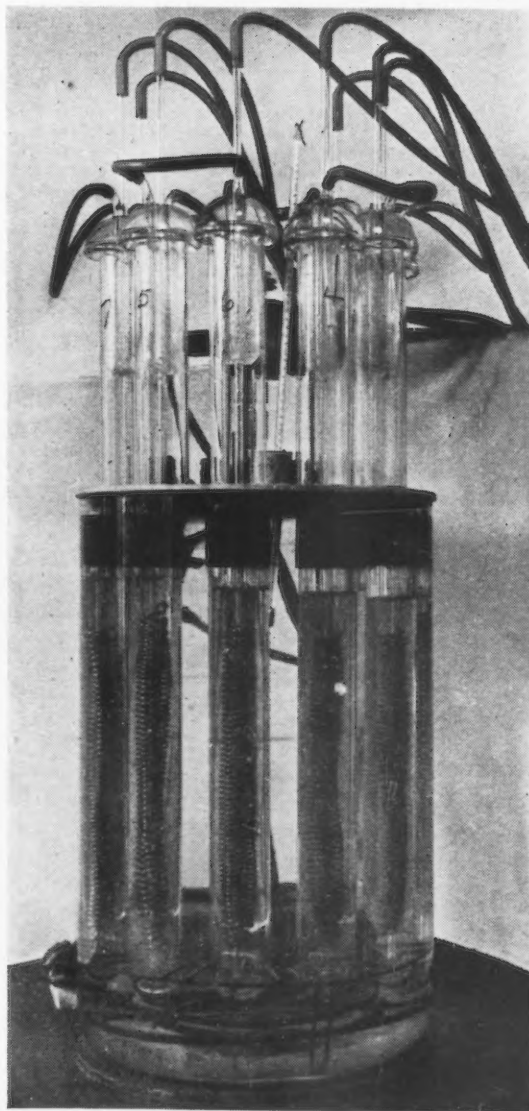
The accelerated oxidation-corrosion tester developed by Pope of Eastman Kodak Co.<sup>7</sup> predicts the useful life of a lubricating oil, determines an oil's ability to protect ferrous materials from rusting, and establishes at what point during the life of an oil corrosion products are formed. By employing Pope's criteria of oil deterioration (rusting, sludging, etc.) similar results can also be obtained with the simpler turbine oil stability test.<sup>8, 9, 10</sup> The ASTM committee working on turbine oil oxidation (D2-CIII) has recently further simplified this test by replacing the fritted glass oxygen delivery tube with an open-end bubbler and is now investigating substitution of service characteristics such as rusting, sludging, etc., for acid (neutralization)<sup>11</sup> value heretofore used for determining the useful life of a turbine oil, fig. 1.

The emphasis placed in recent years on the rust preventive action of turbine oils<sup>12, 13</sup> has opened up an entirely new field for the development of industrial

lubricants. Rusting of machinery under operating conditions has frequently not been recognized as such and was often mistaken for wear. In idle equipment rusting may occur even during a week end shut down if the lubricant lacks surface activity and drains off or is displaced by condensation of water. When such equipment is again started up, the rust wears off. Typical cases are reduction gears and antifriction bearings.<sup>14</sup> The red, ferric, or black, magnetic, iron oxides dispersed in the oil will act as abrasives and greatly accelerate wear. Even the hydrophilic oxidation products of uninhibited oil may be unable to prevent rusting and wear. In fact, it has been shown by Dantsizen<sup>15</sup> of General Electric that low molecular weight water-soluble fatty acids (formic and acetic) which are some of the decomposition products of uninhibited lubricants, are rust promoters. There is strong evidence that the increased rate of wear often observed with internal combustion engines under low temperature operating conditions, is also due to rusting.<sup>16</sup> In this last case the water-soluble acidic oxidation products of the fuel further aggravate the situation.

The solution of the problem is to employ surface

FIG. 1—Equipment used for ASTM stability tests on turbine oil.





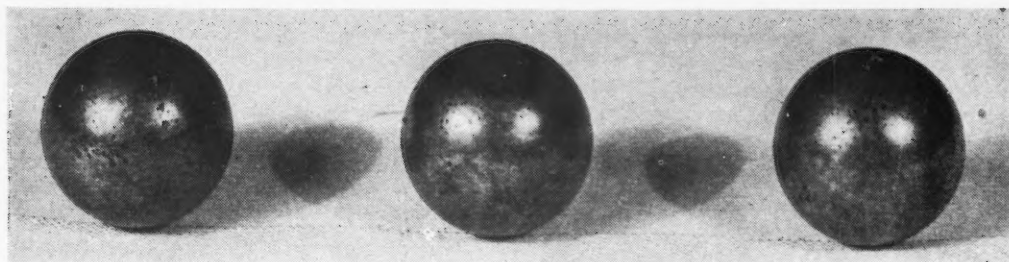


FIG. 2—Pitting evident on these antifriction bearing balls could have been avoided by the use of a proper rust preventative lubricant.

active lubricants which are able to wet metal surfaces, forming a protective film and rendering these surfaces water repellent. Thus rusting and consequent wear can be prevented and the machinery protected by proper selection of the lubricant. The replacement rate of ball bearings on standby pumps in solvent refining of petroleum lubricants was very high until a turbine oil type rust preventive oil was employed as lubricant, fig. 2.

Often modern methods of processing create abnormally severe rusting conditions. One such case was a large aircraft plant using a high speed machining technique. Here the metalworking machinery showed an alarming rate of rusting which may have been aggravated by high humidity. It was necessary to overhaul some of the machine tools as frequently as every three months, at which time parts rusted beyond repair had to be replaced, see fig 3. Some of the large machines took several days to dismantle and the cost in labor, replacement parts and lost operating time

FIG. 3—Lacking adequate rust inhibiting properties, the lubricant used in an expensive machine tool permitted serious corrosion to attack this gear and caused lengthy shutdown of the machine.



became prohibitive. Several hydraulic oils had previously been tried without success, including a fatty oil blend which sludged excessively. In this case a special nonsludging lubricant was developed which resisted rusting induced by high humidity. The oil was tested in the laboratory with the ASTM turbine oil rusting test procedure (D-665-44T) and was found to protect the steel specimens immersed in water under the prescribed test conditions (140°F, 48 hr testing time) without permitting the formation of any rust.

Before introducing this new lubricant at the aircraft plant, all lubricating systems were first thoroughly cleaned. In those machines in which the oil could be heated, a rust preventive cleaning lubricant was first employed (at 150°F) for a period of from two days to two weeks of operation. In these cases no shutdown was necessary and no operating time beyond that required for the oil change was lost. Then the cleaner was replaced by the rust preventive lubricant. In cases where heating was not possible the machines were cleaned manually, then reassembled and charged with the new lubricant. From that time on for a period of over a year no more trouble due to rusting has been reported.

The oil in the machines cleaned with the lubricant cleaner continued to loosen accumulated rust and was changed bi-monthly until no more rust showed. The manually cleaned machines showed no rust whatsoever. However, while in this case complete success was attained, it would be an error to conclude that this special lubricant will protect under all conditions of corrosion, irrespective of the type or concentration of corrosives involved. Another point worth remembering is that metal surfaces already wetted by water and attacked by rust will not be easily wetted by conventional bulk-type lubricants containing surface active agents. They must first be cleaned and made accessible to the lubricating oil. Additives able to displace water and preformed rust from metal surfaces are usually too active to be used in industrial lubricants since they tend to unduly decrease oil stability and cause sludging, fig. 4.

In addition to rust prevention and wear prevention directly or indirectly due to rusting, other equally tangible results can be realized by the use of these special lubricants. In certain hydraulic systems in several manufacturing plants, where straight mineral oils were unsuitable due to their lack of oiliness, with resulting chattering, and where fatty oil blends caused excessive sludging due to oil breakdown, a stable mineral oil blend containing surface active additives completely stopped chattering after only a short period of operation with this lubricant. In these cases the smooth operation was due to the superior wetting power imparted to the oil by these hydrophilic additives.

The load bearing and torque characteristics of cer-

tain polar compounds which have been investigated recently by E. M. Kipp<sup>17</sup> are not the subject of this article. When discussing protective surface active agents they should not be confused with extreme pressure additives, which prevent welding but otherwise have no protective value. On the contrary, they may actually promote rusting and thus contribute to wear. The basic difference between these two types of materials was pointed out by R. G. Larsen.<sup>18</sup>

It should be kept in mind that the above discussed protective lubricants do not function as an easy cure-all and that considerable discretion is necessary when selecting surface active lubricants for special applications. Each case should be decided on its own merits and preferably through consultation between the oil user and supplier. The type and concentration of the oil additive should be such that it will accomplish the purpose without interfering with any other of the essential functions or service characteristics of the lubricant. Foremost to be kept in mind is the stability and freedom from sludging under the specific operating conditions. Thus the proper selection of the lubricant requires a high caliber of lubricating engineering.



FIG. 4—When corrosion has spread to the extent shown on this gear box, the part should be completely dismantled and cleaned before even the best lubricant can prevent any further reaction.

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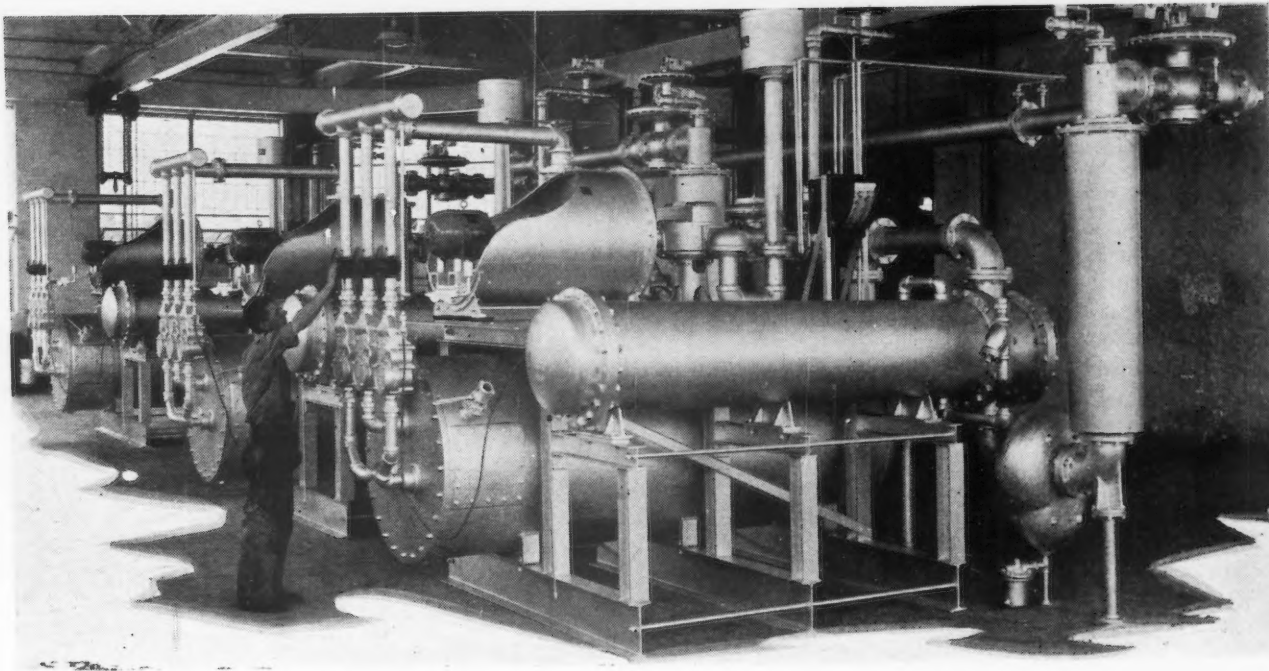
## Nitrogen in Bessemer Steel

A STUDY of means of controlling nitrogen content of bessemer steel in order that bessemer might be substituted for openhearth steel, and thus enlarge its application, was made during the war at the Friedrich-Alfred Works, Rheinhausen, Germany. This study was published as a CIOS report and was discussed recently in the Iron & Coal Trades Review, London.

The deoxidation practice of killed bessemer steel was studied in an attempt to fix nitrogen at 0.015 pct max. The procedure considered the best was first to add 0.06 to 0.10 pct Si and then add from 2 to 3½ lb of aluminum per ton. There is approximately 20 to 60 pct recovery of aluminum. Titanium additions have been tried, but it was stated that the solubility was very poor. It was also stated that reladling is necessary to obtain uniform distribution of aluminum or titanium.

The analysis of bessemer steel used for sheet bar for heavier sheet gauges was C, 0.06 to 0.08 pct; Mn, 0.30 to 0.40 pct; P, 0.025 to 0.03 pct; S, 0.03 pct max; and Si, 0.06 to 0.08 pct; for tinplate, C, 0.08 to 0.12 pct; Mn, 0.30 to 0.45 pct; P, 0.04 pct max; S, 0.05 pct max; Si, 0.12 to 0.17 pct with 0.02 pct Al added. No titanium was used. With high aluminum recovery, this material was reported as non-aging. The management, it was reported, preferred to use openhearth steel for deep-drawing applications, and to use bessemer steel only when the openhearth material was not available. All rails made in Germany were produced in converter steel of the following approximate composition:—C, 0.42 to 0.48 pct; Mn, 0.50 to 0.65 pct; P, 0.70 pct max; S, 0.05 pct max; and Si, 0.25 pct. Manganese content formerly was 0.60 to 1.75 pct, but was reduced due to the alloy shortage.





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## A Critical Survey Of

# Controlled Atmospheres

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**E**QUILIBRIUM has been described as a balancing of reactions about a common mean. The greater the number and concentration of reacting constituents, the more frequently must balancing cycles occur to achieve and maintain the presumed equilibria with respect to the steel. Further, the higher the concentration of active gases, the wider the swing between the extremes around the point of nominal balance; that is, the action is somewhat analogous to that of a pendulum, but is complicated by the fact that the width of swing is a multiple function of interacting factors among five or more major constituents. Roughening is brought about by numerous effects

*This is the third part of a three part article. In the first and second parts (THE IRON AGE, Sept. 19 and 26), the authors presented a code system for identification of the various types of atmospheres and reviewed some of the popular concepts concerning the functions of controlled atmospheres.—Ed.*

of the balancing reactions. As many of the chain cycles are catalyzed by contact with the hot steel, and all the sequential operations occur adjacent to or in contact with the steel surface, there is the factor of

molecular erosion and redistribution which becomes a cause of roughening. Further, as the source of available carbon is usually along the grain boundaries of the steel, insofar as carbon reactions in the surface of the steel itself are concerned, the migration of carbon takes place predominantly along the grain boundaries with resulting emphasis of outlines.

Following the problem, where an oxidizing cycle is in any way incident to a chain of reactions, though ultimately leaving no trace of an oxide, the formation and reduction of isolated oxides of iron increase the roughening tendency since the oxides occupy more space than the reduced iron. As oxides are formed and reduced, growth and migration of free iron create roughened patterns throughout the surface. The tend-



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**The authors explore the effects of Dalton's law of partial pressures and the laws of valence on the chemical equilibrium reactions which occur in all heat treating controlled atmospheres. Since these reactions tend to disturb the composition of the introduced atmosphere, they must be taken into consideration. The complexities of the equilibrium function in rebalancing the atmosphere are also discussed.**

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ency for roughening to be more pronounced in the more active atmospheres, even when they are in ultimate equilibrium with the steel, therefore, resolves itself into an effect of mass action, where the greatest disturbance of the surface is brought about by the greatest number of unit actions in a given time at a given temperature in contact with a unit area of metal.

It follows from this that the atmosphere which can attain chemical equilibrium with the fewest active elements at the lowest effective concentration of each, will have the least noticeable roughening tendency due to the phenomenon of mass activity. This has been proved in practice in the case of properly prepared class 2 atmospheres which have shown no tendency towards roughening quite sensitive materials.

The escape of carbon from steel, occurring in compliance with thermodynamic principles (but most effectually described in terms of Dalton's law of partial pressures, as currently understood) can only be overcome by establishing an effective back pressure of carbon in the atmosphere. It must be remembered that the rate of gain or loss of carbon in steel is a function of the carbon differential in the steel and the atmosphere. The greater the disparity in either direction, the more rapid the tendency to approach a satisfactory equilibrium; but, as that condition is approached, the rate of gain or loss diminishes as the inverse function of the square of the difference until the condition of nominal equilibrium is approached.

The rate of reaction is also governed by laws of valence which are a function of the relative position of the various constituents in the electromotive series. The laws of true chemical compounds are rather rigidly delineated for normal conditions of reactions, but the chemical bonds of all compounds are weakened by increase in temperature, as illustrated by cracking of hydrocarbons for carburizing purposes. At elevated temperatures many phenomena occur which change the relative effectiveness of the normal electrochemical bonds. It is the factor of thermal modification of the normal valence characteristics which provides for the effectual equilibrium factors in any given atmosphere. However, at any temperature, the rapidity with which reactions occur, inevitably becomes a function of the total concentrations and the proportional differences.

With this thought in mind, it must be remembered that change of total concentration of any active constituent not only changes the environment of the other constituents and of the materials contained in the atmosphere, but also changes the environment with respect to the changing constituent itself, so that all reactions which tend toward an equilibrium condition are most active the more remote from nominal equilibrium they are at the start. Conversely, the lower the disproportional balances, the less rapid the actions tending to establish equilibrium; and the lower the total concentrations, the fewer the unit reactions in a given time at a given temperature.

It is interesting to consider the complexity of an equilibrium function in an atmosphere with only five interacting, mutually interdependent variables. The number of balances which must be attained, or the number of recovery reactions which occur to re-establish an equilibrium, when a molecule of oxygen or other active constituent enters and disturbs the nominal equilibrium, becomes a function of five variables to the fifth power, i.e., somewhere in the neighborhood of 3125 molecular interactions occur to effectuate a rebalancing of the system. This may be difficult to believe at first glance, but a study of the problem shows the validity of this relationship, and illustrates why roughening occurs and true neutrality or equilibrium never exists in actual practice, other than for fleeting moments. Cracked fuels evolved from the effort to attain more favorable CO-CO<sub>2</sub> and H<sub>2</sub>-H<sub>2</sub>O ratios. As the total concentration of active constituents is increased, despite apparently favorable ratios, the complexity of equilibria factors are multiplied, thereby emphasizing roughening reactions (though sometimes attaining freedom from oxidation or decarburization).

An unfailing universal rule for the determination of the most suitable concentration of CO or H<sub>2</sub> for a given carbon content is impossible to derive. Various alloying constituents in varying concentrations will change reaction rates of carbon with atmospheres. These can only be discovered by careful study of actual practice. However, for most high-carbon and alloy tool steels, concentrations of about 9 pct CO in conjunction with 15 to 18 pct H<sub>2</sub> are almost universally satisfactory when removal of H<sub>2</sub>O and CO<sub>2</sub> has been effectively carried out. This is due to the fact that the carburizing tendency of CO in low total concentrations is slight, and, as a function of time at temperature, in most instances, it has no practical effect on readily carburized steel. Further, as the temperature increases, within operational limits, CO being relatively more stable, the reactions which occur, do so more slowly.

In the absence of CO<sub>2</sub>, a concentration of about 9 pct CO is sufficient to counterbalance all carbon escape tendencies of most carbon steels. For a few very sensitive tool steels, where the concentration of 15 to 18 pct H<sub>2</sub> is slightly decarburizing, in excess of the recovery capacity of the CO or the steel itself, a very small potential of CH<sub>4</sub> effectively suppresses carbon escape.

Where an infinite ratio of CO/CO<sub>2</sub> exists, even though the total concentration of CO is reasonably low, and provided the unit area concentration is proportional to the unit area escape potential of the steel, neither carburization nor decarburization is a practical problem. The true unit area concentration of available carbon in an atmosphere and the unit area escape potential of varying steel alloys is difficult to determine other than by trial tests under controlled

conditions. As carbon escape or acquisition is in inverse proportion to the total disparity in active carbon concentrations in atmospheres of minimal active concentrations, effective control is far more readily attained, particularly when active negative constituents have been removed.

The nonferrous metals in table III will be dealt with briefly in order to tie together all of the material which this paper is attempting to survey. The table attempts to separate the major thermal treatments of the more important nonferrous industrial metals, for example: (1) Annealing of copper-base alloys; (2) hardening of certain copper, aluminum and magnesium-base alloys; (3) the relatively new field of protection and refinement of molten nonferrous metals; (4) treatment of nonferrous power metallurgy products, and (5) a wide range of nonmetallic surface treatment methods.

Prior mention has been made of the effect of hydrogen on nondeoxidized copper and copper-base alloys. In practice such materials form a relatively small percentage of the total copper-base alloys being annealed. The most critical annealing problems are encountered in handling 70-30 brass, and all copper-zinc alloys where the copper is less than 85 pct of the total. Pure, dry nitrogen, classes 1 B, d\*, and 7 B, d, as well as 8 A, d, are required to minimize the detrimental effects which water vapor and carbon dioxide have on these

*\*See Part I, Sept. 19, for codification chart identifying the various atmospheres.*

metals. Of the three, class 1 B, d, is usually the most economical for large volume use. However, class 2 B, d, offers an advantage always lacking in pure nitrogen atmospheres, namely the ability to neutralize inevitable increments of oxygen. Here, as in steel treatments, the high ratio of  $H_2$ - $H_2O$  is favorable to good results. Where some oxidation has occurred prior to treatment, the  $H_2$  potential usually will reduce the oxides and produce a brighter surface than previously existed. This is true of all copper-base alloys where hydrogen embrittlement is not a factor due to occlusion of oxygen and inclusion of oxides throughout the structure.

Study of table III indicates that properly modified grades of class 1 or class 2 atmospheres are suitable for almost all listed nonferrous treatments. Aside from cost, classes 3 and 4 as well as classes 9 and 10 have detrimental effects on many of the nonferrous alloys. It is interesting to observe that brass can be very effectively treated in pure hydrogen atmospheres, though such treatments offer little advantage, if any, over handling in class 2 B, d, atmospheres. The copper-nickel alloys are best treated in pure nitrogen, though here again, for the same reasons already stated, class 2 B, d, offers the advantage of aiding in the control of oxides. In general, all other copper-base materials can be satisfactorily annealed in dried class 1 or 2 atmospheres, though there are many short-time annealing treatments which do not require freedom from moisture for satisfactory results.

Hardening treatments of beryllium-copper are most effectively done in dried combustion atmospheres. The primary requirement of avoiding oxidation of beryllium is best attained in a dried class 2 atmosphere. Here again, the advantage of a neutralizing potential and a wide ratio as a margin of safety, acts in its favor. Other more expensive atmospheres, such as classes 3, 4 or 5 may be used, but economic factors are against such expense. Controlled atmospheres for

solution treating aluminum and magnesium-base alloys is a relatively new field, and in the past, essentially no atmosphere has been used to protect aluminum, while protection of magnesium has been attained by using sulfur products. However, several years ago one of the authors pointed to the obviously favorable results which would accrue from the use of the products of combustion of fuel gas for the protection of magnesium, with the result that many direct-fired gas-heated furnaces are now in use for this purpose.

The manifold disadvantages of sulfur gases for protecting magnesium in electrically heated furnaces, plus the frequent fires which occur, indicate the need for protective atmospheres, without these very grave deficiencies. Such protective gases are most efficiently generated with partial or complete combustion generators. With most magnesium alloys the water need not be removed. This is contrary to recently published data\*\* which tend to indicate water as a cause of corrosion in heat treatment of "H" alloy. Factors other than the water vapor concentration have far greater effect on corrosion in heat treating. An added advantage accrues when combustion products are substituted for  $SO_2$  in electric furnaces for solution treatment of magnesium, in that such furnaces may also be used for treating aluminum alloys without detrimental effect. This is impossible when furnaces have been contaminated with sulfur products, due to the grave destructive effects of very minute concentrations of  $SO_2$  on most aluminum alloys. An atmosphere containing some free  $H_2$  and CO is more desirable for closest control of magnesium-base alloys, and therefore class 2 A, d, atmospheres offer somewhat more favorable conditions than other combusted gases.

Protection and refining of various nonferrous molten

*\*\* W. Jominy, et al, "Effects of Water in Magnesium Heat Treating," Metal Progress, July 1946.*

alloys are new phases of controlled atmosphere generation and application. For some time commercial nitrogen has been used for modification of various aluminum and magnesium alloys. Use of gases for the purification of copper alloys is a more recently attempted field. Atmospheres containing hydrogen or water must be totally excluded from contact with alloys containing any quantities of copper. Fairly effective grain refinement of various magnesium-base alloys can be attained without superheating by bubbling partially combusted fuel gases through the melt after they have been dried and freed of  $CO_2$ .

In all applications of generated atmospheres, considerable care must be taken to remove all sulfur from atmospheres which are to be used in contact with copper and aluminum-base alloys, whether solid or molten. Magnesium does not appear to be adversely affected by sulfur in any form. Sulfur reaction with brass or copper sheet necessitates expensive acid treatments to remove the discoloration. As little as 0.0002 pct  $SO_2$  can ruin sensitive sheet alloys of copper and aluminum, although aluminum-base cast alloys, containing copper but no magnesium or silicon, are not affected.

Controlled atmospheres are used in powder metallurgy processing to prevent oxidation of the fine powders and to reduce such oxides as are inevitably formed, in order to effectuate better fusing and bonding of the alloys during sintering operations. Class 2 B, d, atmospheres offer nearly the highest degree of control for nonferrous metal powders, though atmospheres of pure hydrogen are used in a few instances.



Inert atmospheres such as class 1 A, d, or 7 A, d, are rarely used due to their inability to reduce oxides.

The wide field of paint drying, enameling, vitrifying, japanning and the other processes grouped under the final column heading of table III are offered merely to direct attention to the fact that controlled atmospheres offer technical advantages in many fields allied to but not normally considered to be metallurgical processes. The most universally applicable of the generated atmospheres is class 2 and its various modifications, though classes 1 and 3 are suitable for many of the processing controls. Patents have been granted on ore reduction methods based on the use of generated reducing gases from fuel gases. Reducing atmospheres, class 2, are too expensive for use in such treatments, and, though they may be more effective, the margin of return must control practical application.

It is worthy of note that in a diversified industrial plant, a central generating station could mass produce a class 2 atmosphere as a base control gas for nearly every processing division of the plant, with proper modifications being made of the quantities required for each particular operation in the ferrous, nonferrous and finishing divisions.

Due to the high temperatures required for most thermal modifications, whether of ferrous or nonferrous metals, the most important single governing law appears to be Dalton's law of partial pressures, as modified to apply to all forms of matter. At elevated temperatures the chemical bonds are less effective, the main governing condition being the search for equilibria among the partial pressures of the numerous constituents taking part in the reactions. Simple chemistry indicates why hydrogen reacts with carbon to decarburize steel, but Dalton's law discloses why, even when chemical reactions cannot occur, decarburization of steels occurs in atmospheres lacking balancing partial pressures of carbon.

Casual mention has been made of the effects which the various components of a given furnace may have on an atmosphere. These are reactions which frequently are overlooked in seeking causes for heat treating failures. Various types of refractory bricks and muffles have very definite effects, through partial catalyzing action or actual chemical reaction, upon the final composition of a furnace atmosphere. New linings and muffles should always be brought into equilibrium with an atmosphere by running dummy heats to insure complete interaction of the possible modifications latent in the refractories used.

Further, in compliance with the law of partial pressures, any container which would exclude infiltration of any gas must be hermetically tight to succeed. In all practical furnace installations, regardless of the method of sealing the equipment, some leaks will exist, if only through the very fine pores of a tight sand seal. Where outflow of the control gases is maintained at all times, internal positive pressure is not sufficient to insure freedom from ingress of oxygen or other gases absent from the initial atmosphere within the furnace. In theory, if a pressure of 100 psi existed within a furnace containing an atmosphere totally free of oxygen, the partial pressure of that atmosphere with respect to the oxygen in the air is zero. Therefore, a positive differential in pressure of oxygen within and without the furnace is 3 psi, which is the partial pressure of oxygen in air at sea level. Hence, if in theory, one opening the size of a single molecule of

oxygen existed to connect the inside of the furnace with air, and if all molecules within the furnace were larger in diameter than the oxygen molecules, eventually the equilibrium of partial pressures of oxygen outside the furnace with the inflow of oxygen would be attained with the result that the total internal pressure would increase from 100 to 103 psi. In all practical situations, internal pressures are just slightly above the outside atmosphere pressures, but the difference of 3 psi exists with respect to the partial pressure of oxygen in the air to the absence of oxygen in the furnace. In addition, most leaks are considerably larger than single molecule size, therefore the general forces tending to force oxygen into the control atmospheres have a strong pressure differential coupled with comparatively large opening through which to force the oxygen.

These are the factors which necessitate the presence of considerable quantities of reducing gases to protect the steel from oxidation by instantly neutralizing oxygen as fast as it enters the furnace. Further, a positive internal pressure within the furnaces of less than 1 psi will assist in excluding the oxygen by the purely mechanical and random means of collision of the oxygen molecules trying to enter, with the molecules of other gases escaping through a given opening. This serves to sweep out of the furnace, part of the water vapor formed in neutralizing the oxygen which attains entrance. It is essential that all work be kept at a safe distance from all vents, deliberate or unavoidable, if freedom from bluing, scaling or other oxidation effects is to be secured. Around each opening, regardless of size, a zone of oxidation exists which can spoil any work within it.

In atmospheres, such as classes 3 and 4, the partial pressure differential of  $N_2$  intensifies the total attack pressure of the existing oxygen differential, with the result that a larger force of entering molecules assail each opening into the furnace, drawing with them relatively weak constituents of the external atmosphere,  $CO_2$  and  $H_2O$ , assisting their undesired entrance into the controlled atmosphere. In this respect, class 2 atmospheres have an advantage over other atmospheres having lower concentrations of  $N_2$ . The total partial pressure of  $N_2$  within a class 2 atmosphere is very frequently the same as the partial pressure of  $N_2$  in the outside air, with the result that the nitrogen within the furnace effectively balances that which is outside and infiltrating molecules of other gases must depend upon their own partial pressures to gain entrance.

Other factors which must not be overlooked in trying to attain perfect heat treating results are all related to the partial pressure factors of carbon. It is useless to generate perfect atmospheres, introduce them into well built furnaces and waste them on controlling the atmosphere around boxes in which tools have been packed in various types of chips. Further, when a tightly sealed box which contains critical steels prevents contact with the control atmosphere, the atmosphere might just as well be omitted. The frequent mistake of placing a high carbon steel part on a low carbon carrying tray ruins many parts, due to the fact that carbon migrates from the high carbon part to the low carbon carrier, with a soft spot created at the point of contact. It is essential that carrying equipment be neutral with respect to the steel being handled if the utmost satisfaction is to be attained from a given treatment.

Carrier gases for carburizing purposes are required



conditions. As carbon escape or acquisition is in inverse proportion to the total disparity in active carbon concentrations in atmospheres of minimal active concentrations, effective control is far more readily attained, particularly when active negative constituents have been removed.

The nonferrous metals in table III will be dealt with briefly in order to tie together all of the material which this paper is attempting to survey. The table attempts to separate the major thermal treatments of the more important nonferrous industrial metals, for example: (1) Annealing of copper-base alloys; (2) hardening of certain copper, aluminum and magnesium-base alloys; (3) the relatively new field of protection and refinement of molten nonferrous metals; (4) treatment of nonferrous power metallurgy products, and (5) a wide range of nonmetallic surface treatment methods.

Prior mention has been made of the effect of hydrogen on nondeoxidized copper and copper-base alloys. In practice such materials form a relatively small percentage of the total copper-base alloys being annealed. The most critical annealing problems are encountered in handling 70-30 brass, and all copper-zinc alloys where the copper is less than 85 pct of the total. Pure, dry nitrogen, classes 1 B, d\*, and 7 B, d, as well as 8 A, d, are required to minimize the detrimental effects which water vapor and carbon dioxide have on these

*\*See Part I, Sept. 19, for codification chart identifying the various atmospheres.*

metals. Of the three, class 1 B, d, is usually the most economical for large volume use. However, class 2 B, d, offers an advantage always lacking in pure nitrogen atmospheres, namely the ability to neutralize inevitable increments of oxygen. Here, as in steel treatments, the high ratio of  $H_2$ - $H_2O$  is favorable to good results. Where some oxidation has occurred prior to treatment, the  $H_2$  potential usually will reduce the oxides and produce a brighter surface than previously existed. This is true of all copper-base alloys where hydrogen embrittlement is not a factor due to occlusion of oxygen and inclusion of oxides throughout the structure.

Study of table III indicates that properly modified grades of class 1 or class 2 atmospheres are suitable for almost all listed nonferrous treatments. Aside from cost, classes 3 and 4 as well as classes 9 and 10 have detrimental effects on many of the nonferrous alloys. It is interesting to observe that brass can be very effectively treated in pure hydrogen atmospheres, though such treatments offer little advantage, if any, over handling in class 2 B, d, atmospheres. The copper-nickel alloys are best treated in pure nitrogen, though here again, for the same reasons already stated, class 2 B, d, offers the advantage of aiding in the control of oxides. In general, all other copper-base materials can be satisfactorily annealed in dried class 1 or 2 atmospheres, though there are many short-time annealing treatments which do not require freedom from moisture for satisfactory results.

Hardening treatments of beryllium-copper are most effectively done in dried combustion atmospheres. The primary requirement of avoiding oxidation of beryllium is best attained in a dried class 2 atmosphere. Here again, the advantage of a neutralizing potential and a wide ratio as a margin of safety, acts in its favor. Other more expensive atmospheres, such as classes 3, 4 or 5 may be used, but economic factors are against such expense. Controlled atmospheres for

solution treating aluminum and magnesium-base alloys is a relatively new field, and in the past, essentially no atmosphere has been used to protect aluminum, while protection of magnesium has been attained by using sulfur products. However, several years ago one of the authors pointed to the obviously favorable results which would accrue from the use of the products of combustion of fuel gas for the protection of magnesium, with the result that many direct-fired gas-heated furnaces are now in use for this purpose.

The manifold disadvantages of sulfur gases for protecting magnesium in electrically heated furnaces, plus the frequent fires which occur, indicate the need for protective atmospheres, without these very grave deficiencies. Such protective gases are most efficiently generated with partial or complete combustion generators. With most magnesium alloys the water need not be removed. This is contrary to recently published data\*\* which tend to indicate water as a cause of corrosion in heat treatment of "H" alloy. Factors other than the water vapor concentration have far greater effect on corrosion in heat treating. An added advantage accrues when combustion products are substituted for  $SO_2$  in electric furnaces for solution treatment of magnesium, in that such furnaces may also be used for treating aluminum alloys without detrimental effect. This is impossible when furnaces have been contaminated with sulfur products, due to the grave destructive effects of very minute concentrations of  $SO_2$  on most aluminum alloys. An atmosphere containing some free  $H_2$  and CO is more desirable for closest control of magnesium-base alloys, and therefore class 2 A, d, atmospheres offer somewhat more favorable conditions than other combusted gases.

Protection and refining of various nonferrous molten

*\*\* W. Jominy, et al, "Effects of Water in Magnesium Heat Treating," Metal Progress, July 1946.*

alloys are new phases of controlled atmosphere generation and application. For some time commercial nitrogen has been used for modification of various aluminum and magnesium alloys. Use of gases for the purification of copper alloys is a more recently attempted field. Atmospheres containing hydrogen or water must be totally excluded from contact with alloys containing any quantities of copper. Fairly effective grain refinement of various magnesium-base alloys can be attained without superheating by bubbling partially combusted fuel gases through the melt after they have been dried and freed of  $CO_2$ .

In all applications of generated atmospheres, considerable care must be taken to remove all sulfur from atmospheres which are to be used in contact with copper and aluminum-base alloys, whether solid or molten. Magnesium does not appear to be adversely affected by sulfur in any form. Sulfur reaction with brass or copper sheet necessitates expensive acid treatments to remove the discoloration. As little as 0.0002 pct  $SO_2$  can ruin sensitive sheet alloys of copper and aluminum, although aluminum-base cast alloys, containing copper but no magnesium or silicon, are not affected.

Controlled atmospheres are used in powder metallurgy processing to prevent oxidation of the fine powders and to reduce such oxides as are inevitably formed, in order to effectuate better fusing and bonding of the alloys during sintering operations. Class 2 B, d, atmospheres offer nearly the highest degree of control for nonferrous metal powders, though atmospheres of pure hydrogen are used in a few instances.

Inert atmospheres such as class 1 A, d, or 7 A, d, are rarely used due to their inability to reduce oxides.

The wide field of paint drying, enameling, vitrifying, japanning and the other processes grouped under the final column heading of table III are offered merely to direct attention to the fact that controlled atmospheres offer technical advantages in many fields allied to but not normally considered to be metallurgical processes. The most universally applicable of the generated atmospheres is class 2 and its various modifications, though classes 1 and 3 are suitable for many of the processing controls. Patents have been granted on ore reduction methods based on the use of generated reducing gases from fuel gases. Reducing atmospheres, class 2, are too expensive for use in such treatments, and, though they may be more effective, the margin of return must control practical application.

It is worthy of note that in a diversified industrial plant, a central generating station could mass produce a class 2 atmosphere as a base control gas for nearly every processing division of the plant, with proper modifications being made of the quantities required for each particular operation in the ferrous, nonferrous and finishing divisions.

Due to the high temperatures required for most thermal modifications, whether of ferrous or nonferrous metals, the most important single governing law appears to be Dalton's law of partial pressures, as modified to apply to all forms of matter. At elevated temperatures the chemical bonds are less effective, the main governing condition being the search for equilibria among the partial pressures of the numerous constituents taking part in the reactions. Simple chemistry indicates why hydrogen reacts with carbon to decarburize steel, but Dalton's law discloses why, even when chemical reactions cannot occur, decarburization of steels occurs in atmospheres lacking balancing partial pressures of carbon.

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Carrier gases for carburizing purposes are required



to have several characteristics, which are best found in class 2 gases. Deposition of soot must be controlled to secure rapid, uniform absorption of carbon. The higher the total concentration of CO, particularly in the absence of CO<sub>2</sub>, the greater the initial tendency for soot to be deposited in compliance with reactions listed previously in the text. The higher the concentration of hydrogen, the greater the concentration of methane required to offset decarburizing tendencies. Higher concentrations of N<sub>2</sub> tend to minimize the tendency for hard carbon coats to form where soot formation cannot be avoided. Most carburizing operations can be performed effectively in class 2, A, c, r, atmospheres. A few very critical steels require complete desiccation, but rarely is the removal of CO<sub>2</sub> required. The continual flow of carburizing gases through the work zone requires a minimum of free soot be present in the gas prior to its entrance into the work area. This is best obtained by stabilizing the gas, i.e., heating the gas to, or above, the work temperature. Atmospheres which contain no initial CO, require excessive concentrations of methane to effect proper carburizing rates, as do atmospheres containing no H<sub>2</sub>. For the most controllable carburizing reactions, atmospheres containing moderate concentrations of CO and H<sub>2</sub> give the cleanest and most uniform results.

The law of partial pressures is the most important law governing atmosphere reactions. Equilibrium reaction occurs in compliance with the correctly interpreted versions of partial pressure factors. Adulteration of atmospheres with undesirable constituents from the air occurs because of partial pressure differentials. Carbon fugacity is nothing more than the factor of partial pressure effect of higher concentrations of carbon in steel than in the environment in which the steel is being heated. Rates of reactions are proportional to partial pressure differentials and eventual equilibria must comply with partial pressure conditions to be stable.

The intent of this survey has been to review the known atmospheres, their modifications and their various deficiencies. It is impossible to completely cover all pertinent phases of controlled metallurgical processing in anything other than an extensive textbook. This article has attempted to clarify various contradictions and to explain some reactions which formerly have not been explained. The explanations offered for the factors of etching or roughening, ultimate surface softening for precision parts of high carbon high alloy parts, and other reactions, are presented as being logical and in compliance with observed practical results.

The overall effect of considering the outstanding defects in controlled atmospheres has tended to place emphasis on currently available modifications of partially burned fuel gases, as being most readily capable of economical, precision, controlled treatments. In fact certain factors discussed so favor the use of such atmospheres for the handling of the most critical materials as to tend to exclude all other types of control gases. The theoretical reasons for such a condition are sound and all available field reports tend to sustain the belief that the class 2 B, d, atmosphere can safely treat the most sensitive steels with the least detriment from etching or ultimate skin softening.

Further, the thought is proposed that central mass

generating units be considered, where practical, for the production of a base control atmosphere from partially combusted fuels, which can be made to conform with requirements by proper partial modification of the required volumes of base gas. In this manner various stages of base and modified gases could be piped where needed throughout a plant to supply all major requirements for controlled atmospheres.

It is the sincere wish of the authors that the idea of a codification of the base atmospheres and their modifications be adopted by the industry for the benefit of all concerned.

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# New Equipment...

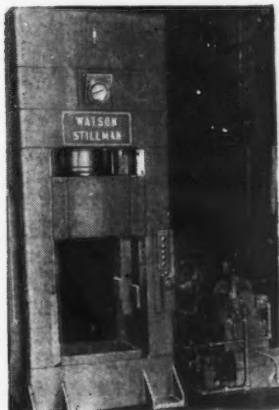
## Stamping and Forming Presses

**Punch presses, high-pressure diecasters, injection and compression molding machines, and forming and bending units are featured in this week's issue. Press accessories, such as dielectric heaters, shuttle feeds, press guards, and hammer boards are also described.**

**P**RODUCTION of a 250-ton mechanical sheet perforating press, arranged to punch out a variety of perforations  $\frac{1}{8}$  to  $1\frac{1}{2}$  in. in diameter in sheets up to 55 in. wide has been announced by the *United Engineering & Foundry Co.*, Pittsburgh. The number of holes of a given size are proportional to the thickness and physical characteristics of the material to be perforated. The punch is motor crank operated, and has speeds of 30 to 120 strokes per min. The

has been added to the line of metal-forming presses produced by the *Watson-Stillman Co.*, Roselle, N. J. Position is controlled by adjustable slowdown, and inching control is

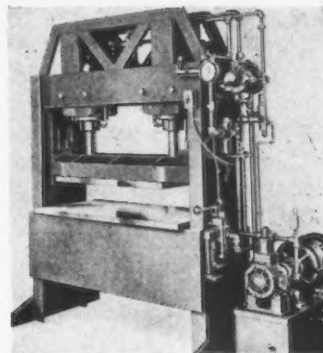
load placed on the rams or packings. Pump equipment is optional, and can be furnished to suit the customer's requirements. The press frame is a weldment. While the platen travel is slower than that of a flywheel press, greater production speed is achieved because, it is said, a shorter stroke is found to be practical. An adjustable, automatic stop can be provided to regulate the length of stroke. The platen may be stopped and reversed at any point in its travel. The mainte-



arranged for die setting. It has a full-range adjustment control of pressing speed. The machine has a prefill system for a rapid traverse stroke. Two radial piston type pumps connected to a 100-hp double end ball bearing motor are standard equipment. Operating speeds are 775 ipm, advance; 225 ipm, pressing; 775 ipm, return.

### Blanking and Forming Press

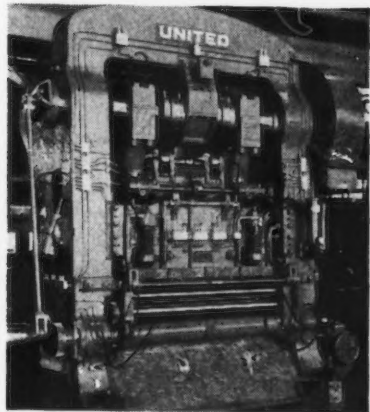
**D**ESIGNED for blanking, stamping and forming sheet metal parts, cutting cloth, rubber, asbestos and similar materials with steel rule dies, an 80-ton press has been produced by *K. R. Wilson*, 10 Lock St., Buffalo. It is also adaptable to compression molding of rubber, plastic or ceramics. Two heavy duty hydraulic cylinders develop controlled pressure to perform the work. Pressure is equalized between the cylinders by mechanical linkage and torque bar arrangement. This linkage assures equal travel of each ram with no thrust



nance problem is simply one of maintaining proper oil level in the reservoir.

### Bench Punch Press

**W**EIGHING only 215 lb, operating at a speed of 285 rpm with a 1725 rpm electric motor, an improved model of a compact 4-ton bench punch press has been designed by the *Benchmaster Mfg. Co.*, 2952 West Pico Blvd., Los Angeles 6. Its features include a precision-ground shaft that is keyed by means of a press fit to a large eccentric, thereby offering a shock-absorbing bearing surface with no weak or thin points to shear or fail. An oversize bronze bushing encloses the eccentric, and full diameter bronze bushings encase the

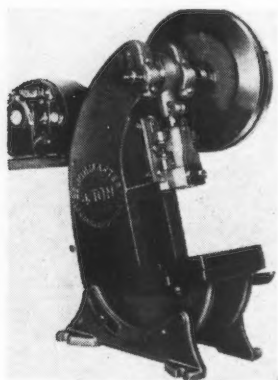


motor is provided with a start and stop single stroke, continuous running and inching control for adjustment of the punches and dies. The material is fed into and out of the press by pinch rolls actuated by an inching clutch and variable stroke crank to give a variable feeding stroke of 0 to 3 in. This feeding mechanism is mechanically synchronized with the operation of the punch. Special shape and grill-work punching can also be done on the press.

### Single-Action Press

**P**ROVIDING control for both manual and automatic single cycle operation with reversal by either pressure or position, a 100-ton capacity single action press

shaft at wear points. The frames are cast in one piece from semi-steel, are mounted on two supports forming a broad stand cradle which allows the machine to be inclined for greater versatility in operation.



An open back makes it possible for work to be inserted from the front as well as from the sides. When the ram is in up-position, a 5¼-in. die space is available. The 6 x 8-in. bolster plate has a thickness of 1 in. and a 2-in. hole in its center. The machine may also be adapted for stamping, marking, punching, crimping, riveting and other high-speed production operations.

#### Plastics Injection Press

WITH a capacity of 1 oz, a power-operated plastics injection press, model H-200, has been designed by the *Van Dorn Iron Works Co.*, 2685 East 79th St., Cleveland 4, to meet the need for a simplified, easily-operated molder. Powered for production, plunger injection and mold closing are operated by hydraulic cylinders. A gear-type pump driven by a 2-hp electric motor develops up to 1500-lb line pressure. Automatic parts ejection is accomplished by a simple knock-out and ejector pin arrangement. Automatic temperature control is provided by heating bands arranged in two zones with temperature in each zone maintained by an individual thermostat within  $\pm 6^\circ\text{F}$ . The range of the thermostats is from  $100^\circ$  to  $500^\circ\text{F}$ . Minimum mold thickness is 3 in. and maximum, 8½ in. Platen area is 8 x 8 in. and mold opening, 6 in.

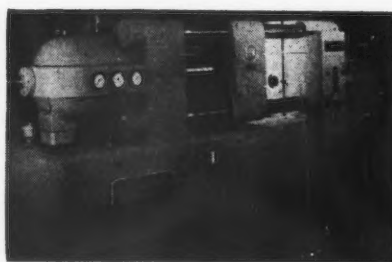
#### Diecasting Machine

ON-THE-SPOT diecasting has been made available for industry with the development of a high-speed production diecasting machine said to cost no more than

a bandsaw or a small engine lathe and which uses prefabricated die sets. Diecasting may be done in any machine shop with the DCMT Die Caster, announced by the *DCMT Sales Corp.*, 401 Broadway, New York 13. Machine tool dealers supply prefabricated blank die sets, permitting the manufacturer to make his own dies. Machining the die cavity and grinding the gate are required. The machine takes only 2 to 3 min to set up, and runs as small as 250 parts can be made or production speed of 600 shots an hour may be reached.

#### High-Pressure Diecasters

TWO high-pressure diecasting machines for casting magnesium, aluminum and copper alloys have been announced by the *Hydraulic Press Mfg. Co.*, Mount Gilead, Ohio. In these self-contained machines, mold clamping, metal injecting, core pulling and ejecting units are operated by direct hydraulic means. H-P-M machines have injection capacities from 12½ to 100 cu in. per cycle. Injection pressures from 6000 to 50,000 psi are available, depending upon plunger diameter. Two standard machine models, the 400-A for aluminum and the 400-M for magnesium have been produced. The basic difference between the models is the speed of the plunger. On the magnesium machine the plung-

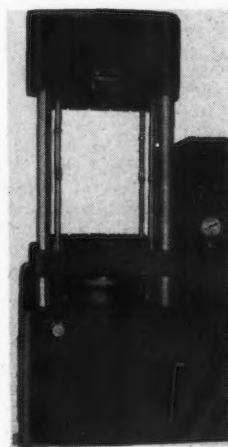


er is actuated by a nitrogen accumulator, providing injection speeds up to 7200 ipm. The aluminum machine employs straight-line hydraulics, the injection ram being directly connected to the Hydro-Power radial pump. Maximum injection speed of the aluminum machine is 750 ipm.

#### Semiautomatic Molding Machine

SUITABLE for either compression or transfer molding, a semiautomatic molding press of 100-ton capacity has been offered by the *Watson-Stillman Co.*, Ro-

selle, N. J. Degassing control by time rather than limit switches is a feature which allows complete range of die opening and ready adjustability. The press is arranged for attachment of a top transfer



cylinder, which is optional equipment, and which with the addition of a plate, can also be used as top hydraulic ejector cylinder. Open-column construction provides dissipation of heat, permits full accessibility to molds and provides an adjustable opening. Die space is 20 x 21 in.; stroke, 12 in. The operating pressure is 2200 psi. Speeds are: advance, 260 ipm; pressing, 13.5 ipm; return, 220 ipm. Capacity of the top cylinder is 25 tons and the unit is powered by a 5-hp motor.

#### Cold Chamber Diecaster

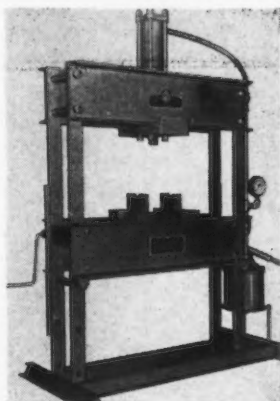
BUILT for water or oil-hydraulic operations for working copper, aluminum, magnesium and zinc alloys, six sizes of cold chamber diecasting machines have been announced by *Hydropress, Inc.*, 570 Lexington Ave., New York. These machines having three tie rods are of horizontal design with vertically arranged injection chambers. full-hydraulic, self-contained, semiautomatic and electrically controlled. Since the pouring station is separated from the die, the metal cannot be injected without closing the die. Automatic follow-up of speeds and pressures assures high flexibility of diecasting operations to conform to the natural flow of the metal. A double action injection valve for slow injection speed at the beginning, and a booster action, increasing the speed in progress of the injection, insures slow metal filling velocities and high final pressures.



Upon opening the die the casting is ejected automatically. Models range from 10 to 190 tons injection pressure and have casting volumes respectively of 3 to 300 cu in.

#### Shop Press

**C**ALLED the Sixty, and featuring fast operation, ruggedness, versatility, and large capacity for work size, a shop press of 60-ton capacity has been announced by *Rodgers Hydraulic Inc.*, St. Louis Park, Minneapolis. Power is supplied by a 2-speed hydraulic hand pump which, in high speed, moves the ram  $2\frac{1}{2}$  in. per pump stroke, giving up to 2000-lb pressure in fast travel. Ram travel is a full 13 in. at a continuous stroke, due to the long cylinder. Flexibility of the press is achieved through

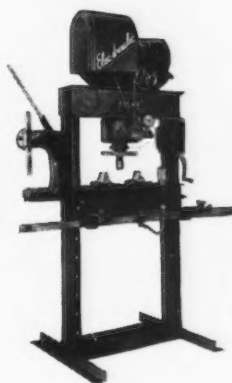


adjusting the lower bolster by means of a hand crank. Maximum opening between bolsters is 38 in., minimum is 8 in. Working width between the sides is 45 in. Special attachments for ring gear riveting and for aligning and centering shafts, rod, etc., are available, as well as an adjustable end support stand for handling long material. Pressing, straightening, shearing, bending, clamping, riveting, broaching and assembly work are shop operations possible with this Rodgers Sixty.

#### Electric Hydraulic Press

**A**PPlicable to assembly, straightening, bending, forming and pressing operations in the manufacture of automobiles, appliances, farm equipment, and other mechanical products, an electrically operated hydraulic press, called the Elec-draulic, has been announced by the *Dake Engine Co.*, Grand Haven, Mich. It is supplied in 50 and 75-ton capacities, with all

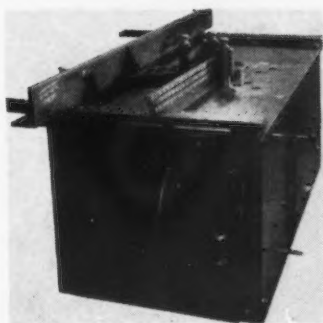
pressures controlled by a fingertip control and release valve. The press features variable ram speed, from 0 to 6 ipm, and a movable workhead, which is easily moved to any point along top channels for off-



center work. Safety is assured by a dump valve which protects the press against overload. The frame is constructed of arc-welded steel, reinforced throughout. A pressure gage at eye level allows easy reading. Press table height is changed by means of a hoisting crank.

#### Bar Bending Machine

**B**ASED on the earlier G.D.S. bending machine, but redesigned, simplified, and strengthened, an automatic machine for bending reinforcing bars, the model 50 H10 G.D.S., has been announced by the *Klingelhofer Machine Tool Co.*, Westfield, N. J. A 10-hp motor drives a hydraulic pump which in turn drives a fluid motor, thus eliminating all clutches. Oversize gears serve to transmit the fluid motor power to the turntable which is carried on large radial and thrust

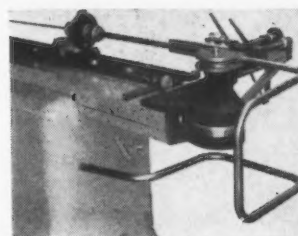


bearings in a single 1400-lb Meehanite casting. This latter is so designed that all operating loads are carried by it, eliminating any twisting of the machine as a whole, under even the heaviest loads, it

is said. Single bends may be made by the use of hardened pins and rollers inserted in holes in the turntable and the stationary top of the main casting. Double bends are made by attaching a banjo arm to the turntable and installing an adjustable backstop. Use of a special bracket provides for stirrup bends. Manual or automatic control may be employed depending upon the number of bars to be employed. The machine is said to develop a torque of 160,000 ft-lb, and to be able to bend 2-in. round bars without difficulty.

#### Bending Machine

**W**ITH a capacity of  $\frac{3}{8}$  to  $1\frac{1}{2}$  in. ferrous or nonferrous tubing, a new model Leonard-Douglas Bendmaster, which is hydraulically operated, has been manufactured by the *Leonard Precision Products Co.*, 1100 Larson Ave., Garden Grove, Calif. From 1 to 10 bends may be



made in a single length of tubing with only one setting. This unit is designed for any production bending operations requiring multiple bends per tube and duplicate parts such as steel furniture frames, air conditioning, refrigeration, automotive and aircraft tubing.

#### Brake

**D**EVELOPMENT of a superior style of brake, known as the Di-Arco brake No. 4, has been announced by the *O'Neil-Irwin Mfg. Co.*, 302 8th Ave. S., Minneapolis. This brake incorporates special material clamping action making possible extremely sharp bends. A double-edge vertical holding plate allows close reverse bends to be formed and a quickly adjustable material gage assures precision in all duplicated parts. The unit also features precision angular degree stops. Brake No. 4 has a material capacity of 16 gage sheet steel and a maximum forming width of 24 in. It weighs 285 lb. Complicated parts may be duplicated to a high degree of accuracy, it is claimed, in

a variety of ductile materials such as copper, bronze, stainless steel, aluminum, bi-metals, sensitized materials, varnished cambrics and dielectrics.

#### Dielectric Heater

**E**LECTRONIC heaters for dielectric heating of plastic preforms have been announced by the Industrial Heating Div., General Electric Co., Schenectady, N. Y.



The heaters feature fast heating, simple operation and sturdy construction. They are designed for operation at 40 megacycles, using a water-cooled oscillator tube, which operates at a high frequency and has a generous short-time overload capacity, making possible the use of an average full-power 5-kw output during the entire heating cycle, thus speeding up the preheating operation. The preheat cycle is started by means of a push-button station and the rest of the operation is entirely automatic. The oven cover opens automatically at the end of the preset heating cycle. The unit is small enough to fit between two molding presses, thus accommodating the alternate operation of the two presses.

#### Shuttle Feed Accessory

**A** SHUTTLE feed accessory for use on the Multipress has been announced by the Denison Engineering Co., Columbus 16, Ohio. This development is said to permit a variety of high speed production jobs, one of which is powder pelleting. Hydraulic cylinders for ejection and for actuation of a powder feed box can be installed on either a 4 or 6-ton Multipress. The three rams, the press ram, the ejection ram and the feeding box ram, are interlocked. The press

ram action can be preadjusted to deliver up to 18 short full pressure loaded strokes in conjunction with each full stroke. These short vibratory strokes can be adjusted in a range from 1/32 to 1/2 in. in length. The maximum rate of ram travel is 200 in. per min down and 300 in. per min up. During the last 2 in. of ram stroke pressure downward, the speed can be reduced to 40 in. per min, thus making it possible, it is said, for a forming punch to approach a die rapidly and then be slowed down as it enters the die. An individual pressure regulating adjustment is provided for the ejection ram. Die fills up to 3 in. deep are available and dies up to 4 in. in diam can be used on the press shown.

#### Punch Press Guard

**A** PUNCH press guard, which gives protection against operator accidents on hand-fed punch presses, has been announced by Dake Engine Co., Grand Haven, Mich. This guard can be applied



to ram action machines, such as punch presses, brakes and spot welders. The equipment is mechanical and positive in action, and gives protection, it is claimed, even with semi-skilled operators.

#### Punch and Die

**T**O INCREASE production and reduce die inventories in the pharmaceutical and powder metallurgical industries, the Penn Carbide & Alloy Casting Co., Canonsburg 2, Pa., has designed a punch and compacting die combination. Dies are made of tungsten carbide, utilizing a heat-treated steel case, shrunk around an insert of Penn Carb. Punches are produced with a dovetailed Penn Carb insert which is locked into the shank for added

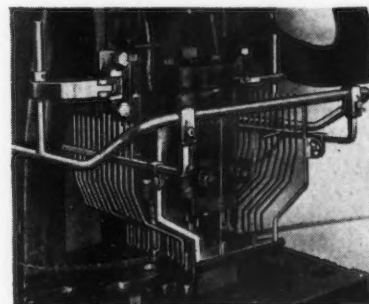
protection during operation. This punch design increases the bearing surface of the carbide and eliminates the possibility of mis-alignment caused by the braze taking a set when under pressure. Another feature is the engraved carbide punch made by the Penn Scribe process which makes possible the engraving of complex and intricate designs on punches which are furnished with the proper draft for tablet compacting.

#### Hammer Boards

**D**EVELOPMENT in built-up hammer boards, called Weldrock, has been announced by Irwin Mfg. Co., Inc., Garland, Pa. The first built-up boards produced were 2 1/2 in. thick, 6 1/2 in. wide and 15 ft long. They were used in the world's largest board hammers (7500 lb) and continued tests in production helped perfect them. Although proven useful for work with heavy hammers, it is said the built-up boards are efficient for all sizes, and have eliminated warping.

#### Die Closure

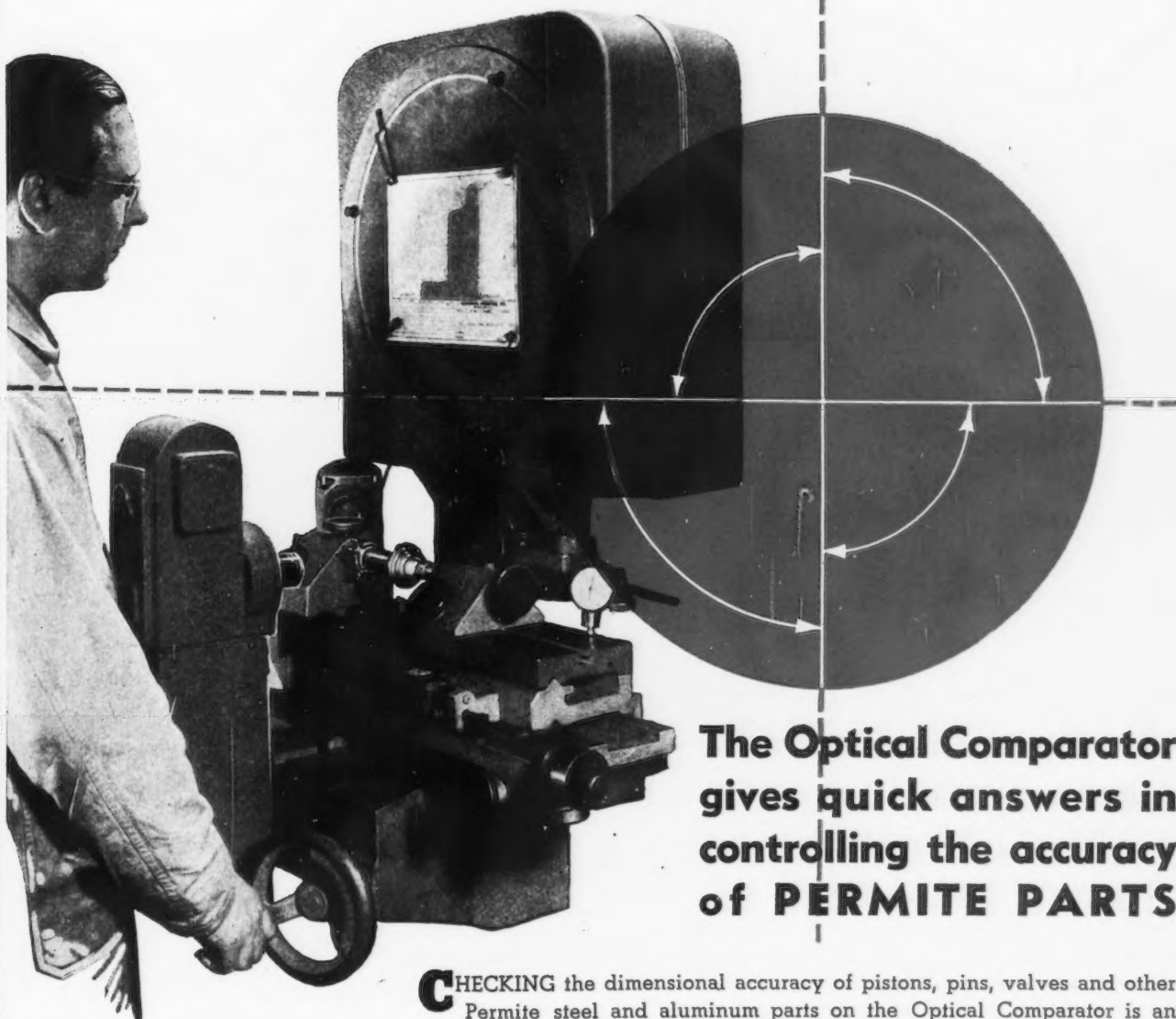
**I**N THE design of the swinging die closure, introduced by the Junkin Safety Appliance Co., Inc., 930-36 West Hill St., Louisville 8, for use on both side and front fed blanking operations, are featured a guard which is adjustable both vertically and horizontally to all dies the press may accommodate, and double pivot mounting bracket to pull the closure straight forward from its set position and swing it out of the way without changing the guard adjustment or the die setup in any way. The press cannot be tripped until the guard is



swung back to position. A splinter proof telescoping transparent plastic front shield affords full unobstructed view of the operating zone at all times. Wire side shields permit close operation to the die and may be raised or lowered as desired.



# How right is a Right Angle?



**The Optical Comparator  
gives quick answers in  
controlling the accuracy  
of PERMITE PARTS**

**C**HECKING the dimensional accuracy of pistons, pins, valves and other Permitem steel and aluminum parts on the Optical Comparator is an important step in Permitem's modern quality control procedure.

The part to be checked is mounted on a universal stage and its image projected on a screen in the upper part of the instrument. Measurements are checked either by placing a properly enlarged drawing on the screen and comparing dimensions, or by moving the part so that its image traverses a distance corresponding to the dimension to be checked. A quick and accurate answer is obtained to every question involving correct dimensions, angles and radii.

This is typical of the precision practices that help insure the accuracy of Permitem valves, pistons, pins, bushings, bolts, shafts and other Permitem aluminum and steel parts for automotive, aircraft and general industrial applications.

Consult Permitem on your parts requirements.



**PERMITE**

**ALUMINUM INDUSTRIES, INC.**

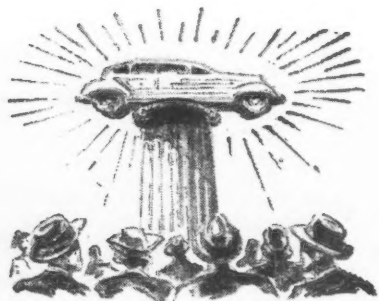
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DETROIT: 809 New Center Building. NEW YORK: 9 Rockefeller Plaza. CHICAGO: 44 E. Jackson Boulevard. ATLANTA: 413 Grant Building  
ALUMINUM PERMANENT MOLD, SAND and DIE CASTINGS...HARDENED, GROUND and FORGED STEEL PARTS

# Assembly Line . . .

WALTER G. PATTON

• Production of cars on the way up; accessory output dropping steadily . . . U. S. importing quantities of iron, copper and lead.



**D**ETROIT—Support has finally come to the bedeviled automobile dealer.

D. U. Bathrick, general sales manager of Pontiac Motor Div. of General Motors Corp. gives the lie to stories that new cars are being "overloaded" when delivered to customers.

According to Mr. Bathrick, the supply of automobile heaters is less than 70 pct of requirements and cars for the West Coast and South are being shipped without such equipment. Moreover, he points out, because the copper required is in short supply little improvement in the supply of car heaters is expected in the near future. As for electric clocks, Bathrick said the supply is reported to be 55 pct of requirements; only 25 pct of accessory bumper guards is available, he stated. At present just 50 pct of Pontiac production is being equipped with automatic windshield washing devices and rear window wipers.

Bathrick disclosed that foam rubber seat cushions are almost unobtainable today and only 75 pct of the required number of fender panels is available.

As a clincher Bathrick argues that while automobile production has been increasing there has been no corresponding increase in the volume of accessories being turned

out. Thus, the number of accessories available per new car sold has been dropping steadily.

**P**ERHAPS to end all dealer stories this department should pass along the one about the new car buyer who it is alleged was forced to buy two fog lights for the rear of his car.

Production of motor cars and trucks in the United States and Canada was off this week from 88,888 the previous week to 81,162 units this week, according to an estimate by Ward's Automotive Reports. A strike in the Outer Drive plant of Briggs Mfg. Co. was responsible for the reduced output, otherwise it is possible that a new postwar weekly production record would have been hung up, according to Ward's. Both Chrysler and Packard plants were crippled by the work stoppage at Briggs and it has been estimated that a loss of 12,695 units resulted from the Briggs shutdown.

The automotive shortage list this week is again headed by seat cushion wire, in both low and high carbon grades. Pig iron, copper and lead remain critically scarce. To these shortages should be added the manpower shortage which gives no indication of improving and is expected to deteriorate further if present trends continue.

**T**HOSE who are accustomed to think of the United States as a relatively self-sufficient nation were rudely jolted this week when George Romney, general manager, Automobile Manufacturers Assn. disclosed that current domestic shortages have forced automobile and truck manufacturers to rely on world markets for certain basic materials ordinarily purchased at home. The U. S. manufacturers, he said, are now importing iron, copper and lead "in quantities."

"Before the war such imports were not as vital to production because domestic stocks were more able to meet demand. But in today's materials emergency such imports are vital indeed," Romney argued.

Overlooked by many persons is the fact that the United States has always depended upon foreign trade for a number of items including chromite for rustless finishes, plating and stainless steel parts; nickel for alloying constructional steel, corrosion resisting materials and many nonferrous metals; vanadium which is used in quantity for axles and springs; tin for solder and bearings; lead for battery plates; antimony; natural rubber for tires, hose connections and insulation. While these are not all the materials used in the modern automobile and truck which are bought in foreign markets, the list offers convincing evidence of our

**LUCKY STRIKE:** A. R. Prance, chief of the Briggs Mfg. Co., looks over the working model of a Mercedes-Benz automobile picked up in Germany by Cpl. Irvine Coleman for two packs of cigarettes. The model is 6 in. long and has a 3½ in. wheelbase. Using a small gear shift knob near the steering wheel, the model can be shifted through three normal forward speeds and into overdrive.





# "And there's your answer, Jim"

In a few minutes, this threading operation will be cutting production costs by increased performance . . . .

The scene below is taking place every day in plants all over the country.

The man on the right is the "Greenfield Man"—a trained field engineer with the "know-how" to get the right answer to a threading problem, and the "show-how" to pass along this information so it can be put into practical use.

Is your plant making full use of "The Greenfield Man" in your territory? *If not, and if you have a threading problem, call the "Greenfield" Man through your "Greenfield" distributor today!*




## GREENFIELD

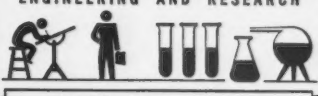
GREENFIELD TAP and DIE CORPORATION  
GREENFIELD, MASSACHUSETTS

**Behind Every GREENFIELD Product..**


**LARGEST MANUFACTURING CAPACITY**



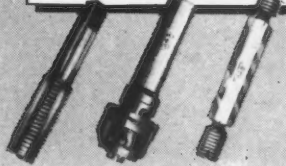

**ENGINEERING AND RESEARCH**



**FIELD SERVICE MEN**



**LEADING DISTRIBUTORS**



present dependence on imports in the production of automobiles.

ONE encouraging statistic about automobiles was the disclosure that tire manufacturers have shipped almost as many replacement passenger tires between Jan. 1 and July 31 of this year as they did in the entire year of 1941, which was the highest year since 1929. For the first seven months of this year, total factory shipments amounted to 35,331,459 tires of which 4,649,537 went to automobile companies for original equipment, 323,894 were exported and the remaining 30,358,208 were sold for domestic purposes.

Some indication of the extremely heavy demand for tires today is revealed by the fact that before the war the highest replacement figure was 34 million tires in 1941. Despite its present achievements in high volume production it is not expected that satisfaction of the present demand for tires and a start toward building up inventories will be possible until after the first quarter of 1947.

Employee suggestion plans were widely used during the war and they worked in GM. It has now been revealed that under the GM suggestion plan operated during the war, 366,467 suggestions were received from men and women on the job recommending improved methods of procedures. For 80,540 suggestions accepted General Mo-

tors paid to its employees in war bonds and stamps a total of \$3,128,995.

The often rumored but as frequently denied acquisition of Bopp Steel Corp., Dearborn, Mich., by Sharon Steel Corp. was announced officially last week. Together with a wholly-owned subsidiary, The Detroit Seamless Steel Tubes Co., Sharon, will be able to convert about 100,000 tons of semifinished steel annually in its Detroit plants.

BOPP has an annual potential capacity of 48,000 tons of cold rolled strip. The present equipment includes one 4-high two-stand 18-in. continuous cold reduction mill; one 2-high two-stand 12-in. continuous tempering mill and one 4-high one-stand 26-in. reversing strip mill.

### Insures Dollar Benefits To Buyers of Equipment

Ottawa

• • • Wartime Prices and Trade Board has passed an order to insure that Canadian purchasers of United States farm machinery receive the benefit of the revaluation of the Canadian dollar, it was disclosed with the publication of the order, dated Sept. 6, in Statutory Orders and Regulations.

As a result of the lifting of the

Sharon has had a financial interest in Bopp for a number of years. The present acquisition was consummated through an exchange of securities between the two companies, the exact ratio to be announced later.

The Detroit Seamless Steel Tubes Co. produces seamless for a well diversified group of customers including the automotive industry, the farm implement and oil industries. It is understood that Bopp's principal outlet for its products is the automotive and automotive parts industries although a number of its customers are not in the automotive field.

It is expected that the two operations will strengthen Sharon's position in the Detroit market and add considerably to the earnings possibilities of the parent company.

Canadian dollar to parity with the United States dollar, the price of American-made farm machinery and other products entering Canada became 10 pct cheaper. Prices Board officials stated the majority of American farm equipment already was covered by a standing order which would insure that the sale price in Canada would drop in conformity with the dollar change, but it was necessary to issue some machinery for which there was no such order.

### Formal Announcement Due on CPA Nail Bonus

Washington

• • • A premium payment plan for production of wire nails beyond the established quotas is expected to be formally announced at a meeting here on Oct. 4 of wire nail manufacturers with Civilian Production Administrator John D. Small and National Housing Expediter Wilson W. Wyatt. It was indicated by a joint statement by CPA and NHA that the Housing Expediter will issue a regulation setting up incentive payments before the end of October to be retroactive to Oct. 1 and covering all production above quotas.

The nails, NHA said, are urgently needed for the veterans housing program. It is expected that the premium will be \$15 a ton as exclusively reported in THE IRON AGE of Sept. 26, p. 112.

**THE CROSLEYS ARE COMING:** The new 1947 Crosley produced at Marion, Ind., was introduced to New Yorkers recently by R. H. Macy & Co., New York department store. This is the first car to enter the low cost field in the postwar period. It is powered by a 4-cylinder, water-cooled, copper-brazed sheet steel, high speed engine developing 26½ hp at 5200 rpm. Top speed is 65 mph. The car is said to operate 36 or more miles per gallon of gasoline.





# USE SPRING LOCK WASHERS



## WITH LOCK NUTS

The lock nut may prevent the nut from slipping, but it can't compensate for the wear or corrosion of the assembly parts or the stretching of the bolt. That's why you need a spring lock washer. Lock nuts with spring lock washers make an ideal combination—safeguard against loss of nut and provide protection against looseness with positive tension.

Diamond G Spring Lock Washers—scientifically designed with CONTROLLED TENSION—assure un-

failing spring tension . . . plus a thrust washer bearing. They permit full tightening of bolts and screws and safeguard against excessive vibration, shock and wear.

Specify Diamond G's today! Samples on request. Write for your free copy of the latest data on the new ASA and SAE specifications on spring lock washers.

**GEORGE K. GARRETT CO., INC.**  
1421 CHESTNUT STREET, PHILADELPHIA 2, PA.  
MANUFACTURERS OF



# DIAMOND PRODUCTS

LOCK WASHERS • • FLAT WASHERS • • STAMPINGS • • SPRINGS • • HOSE CLAMPS • • SNAP AND RETAINER RINGS

• Dept. of Commerce Div. making broad study of steel industry . . . Deals with all phases . . . To take six months or more.



WASHINGTON — What is described as an intensive study of the entire steel industry is being made by the Machinery and Metals Div. of the Dept. of Commerce. Just getting started, it is estimated that it will take 6 months or more for completion. Factors of the industry to be considered include its economics, distribution system, capacity, production, foreign and domestic markets, competitive phase, technological developments and geographical changes.

The purpose of the study was said to be to determine the "significance of the postwar industry to the nation's economy." Being a basic industry, it was explained, steel, of course, has been in the past one of the main arteries of the country's economic structure, but since its wartime expansion, has taken on considerably increased importance. The growth of the industry, the scattering of plants in new sections, particularly in the Far West and Southwest, relationship to markets, and the prospects of building new industries around these plants are all to be studied, so it is said, as well as new products and new uses for steel.

A great deal, if not all, of these subjects have been dealt with in separate articles and reports but

the Division's purpose, so it was stated, is to embody all of them in one comprehensive report. It was not, however, likened to the rather big job done several years ago by the National Resources Planning Board, inasmuch as it will not make any recommendations.

\* \* \*

THERE are, however, reports that there is a group in the government that, taking advantage of the present heavy bookings of the industry, wants to start its own study of the industry with a view to recommending another sharp increase in capacity, to be government financed if private industry was unwilling to go along with the program—and definitely it would not be willing.

This quiet activity has not stirred up much concern because it has been stated that it does not have administration support, but rather would meet with administration opposition if attempts were made to effectuate such a program. This view has been strengthened by the appointment of W. Averell Harriman as Secretary of Commerce.

At the Division offices, it was stated that the study is "purely and simply academic" and that it is being made in collaboration with the industry. It was represented as being an attempt to present a clear and complete picture of the industry with its many ramifications as it is now organized and what it means to the nation. Contention has been made that the study will be of much value not only to business and finance generally, but to the steel industry itself, doubtful though the latter may be regarding this claim.

Inevitably the basing point system and its growth will be a subject for considerable discussion. For many years, it has been bounced about by the government, both in the executive branches and Congress and is due for much more of the same treatment, which often is of a political character. The proposal of the Division, it was declared, is only to present its study factually without comment for or against it. It is hoped to have a complete list of all basing

points and of every product priced on them.

This presumably will be a part of the study on distribution, but a more significant part, if it can be developed, will be a showing of geographic distribution by products, a big undertaking itself. Many years ago, the Federal Trade Commission made a partial study of this kind. The other phases, technological developments, new processes, and so on, also will be sizable tasks. So altogether, the Division, whatever its efforts may bring forth, has undertaken a large assignment and its achievement will be awaited with interest.

\* \* \*

UNSATISFACTORY progress is reported by the Public Roads Administration on approximately 18 pct of the federal highway construction jobs under way. Delays encountered are due principally to shortage of labor, slow delivery of materials, lack of equipment and slowness in starting work by contractors who have other projects to finish. Of the highway structures on which unsatisfactory progress is reported, more than one-half, PRA said, are having difficulty in obtaining structural steel.

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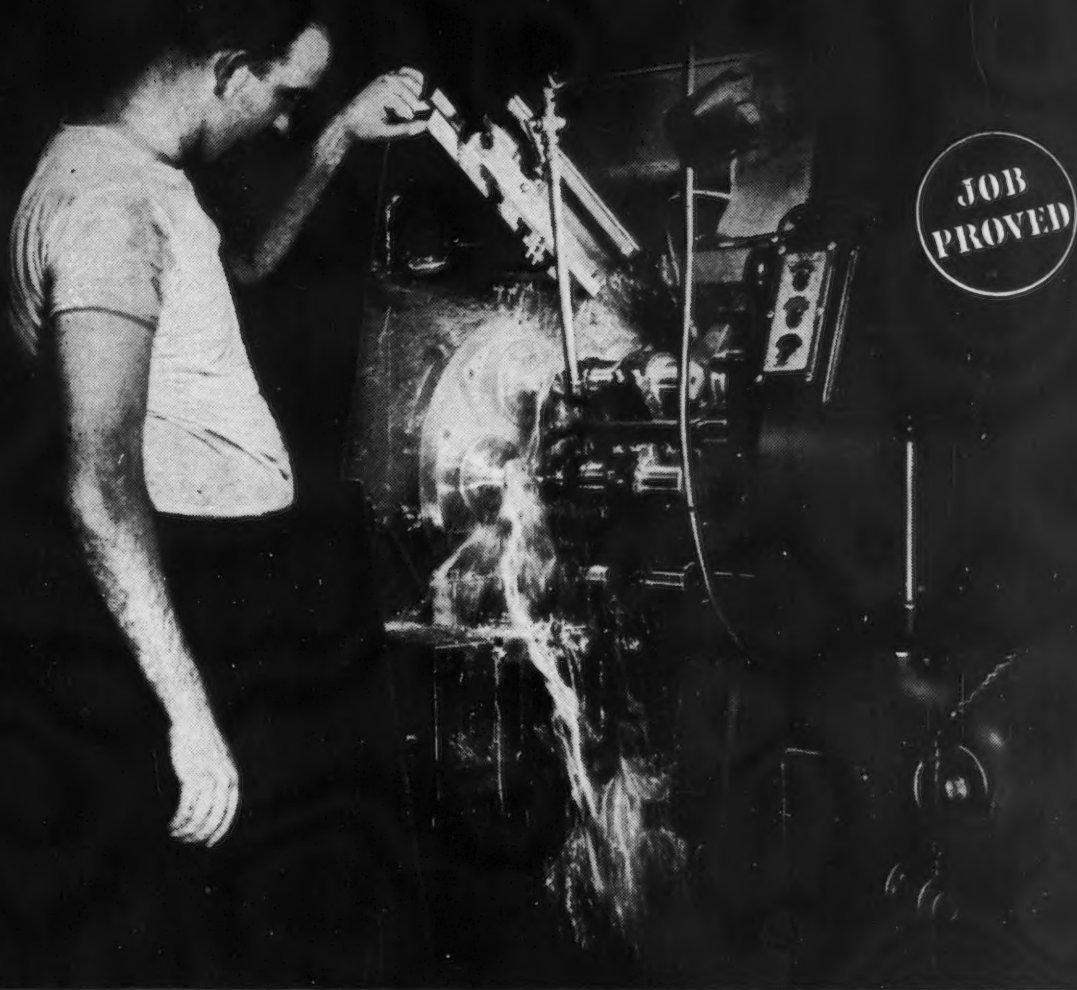
L. T. GEN. R. A. Wheeler, Chief of Engineers, recently revealed the extensive utility operation that must be carried on by the Army to maintain itself in the United States.

The following list shows the maintenance, repair and operations responsibility of the Corps of Engineers at the stations to be maintained in the continental United States during the fiscal year 1947:

Sewer lines covering 9061 miles, equivalent to 3.6 times across the United States; 3157 miles of railroads, equivalent to 1.3 times across the United States; 9076 miles of water mains, equivalent to 3.6 times across the United States; 40,667 miles of 21 ft roads, equivalent to 16.2 times across the United States; 13,959 miles of electric lines, equivalent to 5.6 times across the United States; 2144 miles of gas mains, equivalent to .9 times across the United States; 1754



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*Fine Finish* **AT 400 S.F.P.M.**

## SUNICUT...

**Eliminates Chatter Marks and Poor Finish, Cuts Down Rejects**

A precision manufacturer was turning, boring, and threading small precision parts on Gridley automatics. Accuracy varied. Chatter marks frequently marred the work, and threads were poor. Rejects were too high.

**Here are the facts:**

Type of Machine: National Acme	Material Machined: Commercial Rod
Gridley Automatic Screw Machine:	Brass
2½" capacity; Model R.B.; Six	Speed: 400 Surface-Feet per Minute
Spindles	Feed: .003"
	Lubricant: Sunicut

A change to Sunicut was recommended by a Sun Cutting Oil Engineer. Chatter marks disappeared. Tolerances were maintained. Better threads were made possible, and rejects diminished, resulting in increased production.

The selection and proper application of the right oil always insure top performance. Test Sunicut in your own shop. It is a clear, transparent, sulphurized cutting oil, designed for high accuracy at high speeds on tough jobs.

**SUN OIL COMPANY • Philadelphia 3, Pa.**  
Sponsors of the Sunoco News-Voice of the Air — Lowell Thomas

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miles of steam lines, equivalent to 0.5 times across the United States; 1.02 billion sq ft of floor area, equivalent to 1.4 times Washington D. C.; 2.30 billion kw-hr of electricity, equivalent to 1.6 times Washington, D. C.; 55 billion gal of water, equivalent to 1.2 times Washington, D. C.; 22 billion cu ft gas, equivalent to 1.4 times Washington, D. C.; 13,829 sq miles of grounds, equivalent to Connecticut, New Jersey, and Rhode Island combined; 313 miles of coal cars, containing 2.7 million tons of coal; and 12 ocean-going tankers, containing 1.2 million barrels of oil.

\* \* \*

**B**ACK of the recently concluded trade agreement with Paraguay was the apparent intention of the United States to hold on to its position gained during the war, of chief exporter to this South American country . . . For once, Uncle Sam seems to have come off best in a horse-trading deal. Paraguayan imports to this country consist mainly of badly needed raw materials which were already admitted duty-free or at low rates. The "good neighbor" has substantially lowered rates imposed on purchases from the United States, consisting mostly of manufactured items . . . The treaty is visioned

by the State Dept. as opening up a postwar market for a number of hardware lines, office and business machines, and automotive products, none of which were bought previously in quantity by Paraguay.

### Gives Army Engineers \$10 Million to Build Permanent Fleet Sites

Washington

• • • The Maritime Commission has transferred \$10 million to Army Engineers for the development and construction of five, and possibly six, permanent reserve fleet sites. The five assured sites will be located in the James River at Lee Hall, Va.; Brunswick River, Wilmington, N. C.; Tensaw River, Mobile, Ala.; The Neches River, Beaumont, Tex.; and Suisun Bay, Benicia, Calif. The sixth site under consideration is one of two located in the Columbia River area. According to information available, the Reserve Fleet Div. of the Maritime Commission will be required to maintain in permanent reserve approximately 2500 merchant vessels.

Each of the permanent sites will be equipped with a dry dock

for the preservation of bottoms of the vessels. A 15,000-ton steel dry dock will be installed at the James River site and 12,000-ton wooden dry docks at the other sites. These will be surplus dry docks, obtained from the Navy Dept., and will be used for inspection purposes only. If such inspection reveals need of repairs on any vessel, the job will be handled commercially.

At the time the Maritime Commission requested the Army Engineers to undertake the permanent reserve sites program, development of the Brunswick River site was under way and the dredging is now close to 50 pct completed. Latest calculations show this site capable of caring for about 390 vessels at the maximum.

The Tensaw and Mobile Rivers flow from the north into Mobile Bay near Mobile, Ala. Investigation shows that a site capable of holding more than 700 vessels can be developed in the Tensaw about 20 miles from Mobile. At present, about 150 vessels are moored in the Mobile River but it was found that the larger site in the Tensaw can be developed as cheaply as a 450-vessel site in the Mobile River and the larger capacity site was selected.

Difficulties encountered in acquiring land have delayed the commencement of dredging at the Neches River site, previously approved by the Maritime Commission. These difficulties have now been overcome. It will hold approximately 500 vessels.

The Suisun Bay site can accommodate approximately 500 vessels and now has about 360 vessels moored in it.

### Ferroalloy Price Rises

Canton, Ohio

• • • The Ohio Ferro-Alloys Corp. has announced a price increase for its silicon - manganese - aluminum ferroalloy identified as Simanal effective Oct. 1. After that date prices for lump size and 2 in. x D and 1 in. x D per lb of alloy, f.o.b. Philo, Ohio, freight allowed are as follows: Carload, bulk, 8½¢; carload, packed, 9¢; tons lots, 9¼¢ less ton lots, 9¾¢. Other meshes are available at a premium.

Simanal is an addition agent containing 20 pct each of silicon, manganese and aluminum, balance iron.

### THE BULL OF THE WOODS

BY J. R. WILLIAMS





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Dow Corning has tested paints made from silicone resins and aluminum powder on diesel manifolds and furnace doors at temperatures as high as 600 degrees Fahrenheit.

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A joint committee of the American Institute of Electrical Engineers and the American Society of Mechanical Engineers has standardized the sizes of large steam turbines and the first standard unit for electric power generation is now under construction.

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Federal Telephone and Radio Corp. claim that their new small-size selenium rectifier can replace as many as 29 different rectifier-type tubes now used in radio receivers.

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International Business Machine Corp. is offering the Chinese a typewriter that will print 5,400 ideographs by the use of 43 keys. An experienced user can write about 45 words per minute (English record 149).

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American Steel and Wire Co. has a quarter-inch nail that can be used to tack tags to cold steel ingots.

Texaco has developed a new synthetic grease for aircraft instruments, controls, cameras and small motors that is usable from 100 degrees below zero to 300 degrees above.

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Recent tests indicate that the new railroad car stabilizer, developed by Westinghouse from the gyroscopic tank gun mount, shows great improvement in riding comfort over all kinds of roadbeds.

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Welded tubular chassis, helical springs, independent axles, 1000 pounds less weight and a lower powered engine are among the details of the proposed new low-priced Chevrolet.

FOLLOW THESE PAGES FOR NEWS OF PROGRESSIVE PRODUCTION

The new Duco Metalli-Chrome automobile lacquer uses particles of aluminum to give a metallic luster and is made in 200 colors.

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Slight bends in the last threads of a new lock nut made by Grip Nut Co. permit it to turn freely through most of its travel, yet prevent it from loosening when finally set up.

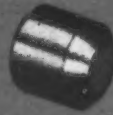
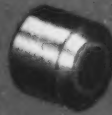
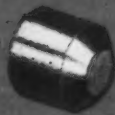
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United Engineering and Foundry will pour a 243-ton casting for a press base which will take one month to cool and another month to anneal.

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University of California scientists have produced a standard for the measurement of length ten times as accurate as the cadmium light ray now accepted by using a light wave from transmuted mercury (made from gold) excited by a high frequency radio beam.

## FOUR

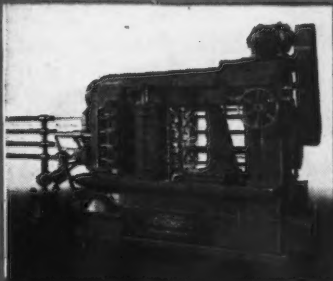


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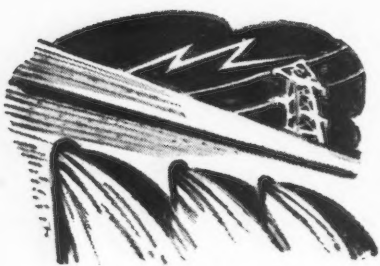
AUTOMATIC MACHINE CO., INC. ★ WINDSOR, VERMONT, U.S.A.

34

# West Coast . . .

ROBERT T. REINHARDT

• U. S. Steel Corp. directors impress westerners with their sincerity, but fail to offer panacea for local steel shortage until after Geneva reaches full production.



**S**AN FRANCISCO—When the world's largest steel corporation bought the plant at Geneva, Utah, it was buying a "pig in a poke" so far as all of the directors except president Benjamin F. Fairless and chairman Irving S. Olds were concerned. Not until the board of U. S. Steel Corp. invaded the West en masse last week did its members see for themselves that the "pig" was a mighty healthy animal and one likely to produce plenty of bacon for the stockholders.

Wherever the group went they praised the plant with such adjectives as "wonderful," "a dream" and "impressive" and gave every evidence that they were pleased with their bargain.

Western steelmen, well aware of the potentialities of the plant, were more interested in getting some commitments from the new owners on production plans, cost of steel and operation organization. In many respects they were disappointed.

The western junket of the directors was anything but a disappointment to them. In Utah, where there had at one time been some opposition to the steel plant, they were feted by politicians and businessmen and welcomed by

officials of the Mormon Church. In California, where \$25 million is being invested in the expansion of facilities at Pittsburg, they again were accorded every courtesy due those who control the production of more than 30 pct of the country's steel. Not the least of the dividends accruing from the trip is an improvement in the public relations of the corporation. Both the press and businessmen were happy to learn that tycoons of this caliber don't necessarily wear armor and carry clubs.

**H**OWEVER, steel users, who have had the secret hope that Mr. Fairless or Mr. Olds would issue some pronouncement which would immediately fill warehouses with stocks of steel, were disappointed. So were those who hoped for a flat statement on how much West Coast users would have to pay for Geneva steel when production is under way.

Mr. Fairless pointed out that, "After all, the corporation had only acquired Geneva a few months ago and that while production was being increased as rapidly as available manpower and raw materials permitted, there was still a long way to go before prices could be determined." He added that all Utah production operations of the corporation including the Provo blast furnace, formerly a part of Columbia Steel Co.'s holdings, would be under control of the Geneva Steel Co. after Oct. 1 with Walther Mathesius as president. It is contemplated that within several months operations at Geneva will be placed under the jurisdiction of Columbia Steel Co., Mr. Fairless added. At present all sales work is handled by this company.

Ingot production was reported as hovering around 40 pct of capacity and two of the three blast furnaces are turning out pig iron. The structural mill is expected to reach capacity production in a few weeks, it was reported.

Beyond these statements and the promise that every effort would be made to install the proposed sheet mill as rapidly as possible, neither Mr. Fairless nor Mr. Olds would go on Geneva as a possible source of immediate relief of the steel shortage in the West. Mr. Fairless did say, how-

ever, and was backed up by William A. Ross, president of Columbia Steel Co., that Columbia fully expected to be in production with its new cold rolling mill in the latter part of the second quarter of 1947.

**I**N response to the question of whether the corporation had joined other producers of sheets in withdrawing from the western market, Mr. Fairless was quite definite in stating that his company was shipping as much, or more, tonnage into this area as ever before.

On the matter of costs of steel from Geneva delivered on the West Coast, the executives were less definite. Mr. Fairless said that Geneva would be established as a basing point but what the price would be he was unwilling to say because he couldn't tell until production was under way and that, like any other plant, these prices would be determined by actual costs.

He stated that raw material assembly costs at Geneva would doubtless be higher than at Birmingham but did not produce figures. This being the case, there is little hope of getting a basing point price any lower than prevails in the East and the only hope for cheaper steel comes through a saving in freight. This latter, of course, depends on what decision is reached by the railroads on the recent appeal of Geneva for an \$8 rate instead of the prevailing rate of \$12 to the Coast. Mr. Fairless assured westerners the price of steel on the Coast would be "relatively" cheaper after Geneva gets going.

Confidence in the ability of the Geneva plant operators to use Utah coal exclusively in the blast furnaces was expressed along with the belief that quality would improve as mines were deepened. According to the executives, ample coal and iron ore is under control to keep the plant operating for at least 25 yr and that more is in sight.

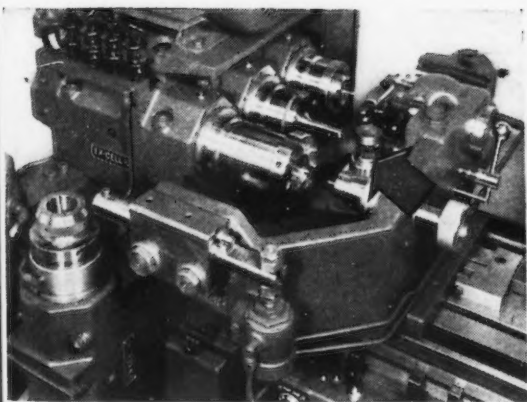
**T**HE present shortage of steel on the Coast was explained by Mr. Fairless as being attributable to the tremendous "bulge" in consumption here and the withdrawal



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FOR LOWER  
COSTS



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Close-up of fixture and tooling set-up to turn O. D., face end, bore pin holes and finish sides of ring grooves of refrigerator compressor piston (note part indicated by ▲). Four operations are executed on four pistons during one cycle of this Ex-Cell-O Precision Boring Machine.



46-91

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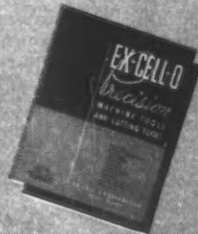
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from the market by other steel companies because they could sell at a better profit in areas closer to their plants. He denied that the West is being "discriminated" against in the full sense of the word and that the shortage was simply a matter of economics. "The only solution to shortages is increased production and our company is tackling the problem from that angle. The war delayed expansion programs, but as you can see, the corporation is now moving ahead as fast as it can. In the West alone we are investing more than \$100 million and, incidentally, that should answer those who ask what we think about the industrial future of your area," Mr. Fairless stated.

Taking the opportunity to disabuse the minds of those who have been inclined to think of U. S. Steel as a corporation owned and controlled solely by eastern interests, Mr. Olds said:

"United States Steel is not primarily connected with the East, or the Middle West, or the South or the Far West. On the contrary, its operations are nationwide in character. It makes steel in nine different states: Massachusetts, Pennsylvania, Ohio, Indiana, Illinois, Minnesota, Alabama, Utah and California. U. S. Steel has mines, quarries, manufacturing

plants, or warehouses in half of the states of the Union, with sales offices in 34 states. Its products are sold in every state.

**P**ROBABLY there is no connection, but as the U. S. Steel Corp. heads departed for the East after doing but little to soothe the fevered brows of steel-hungry warehousemen and manufacturers, CPA officials from Washington arrived on the Coast in response to frenzied requests for relief from the steel famine.

James T. Bray, deputy in charge of production, arrived Saturday to confer with local CPA officials who have had practically to barricade themselves in their offices against the invasion of steel seekers. The local committee which recently petitioned Washington for help heard from J. D. Small, CPA administrator: "Manufacturers of critical housing items have been given preference ratings for third and fourth quarter steel requirements. CPA representatives are being sent to confer with Columbia Steel Co., which is the large supplier in California."

Just what will come of these conferences is problematical since it is generally agreed that there just isn't enough steel to go around and that unless some bonus

or premium can be paid to producers to lay steel down on the West Coast, this area is doomed to a shortage until local production is substantially increased, according to many authorities. Wilson Wyatt's scheduled visit in San Francisco this week will at least give the local petitioners a chance to explain their troubles although the American Legion Convention being held here may interfere with Mr. Wyatt's local schedule.

The local CPA construction division, Gilbert H. Kneiss, manager, is holding a close rein on nonhousing building in line with the administration policy. For the week ending Sept. 19 the local office approved 25 northern California applications of this nature with an estimated cost of \$385,094 and denied 52 applications for \$654,965. One of the applications approved should bring joy to the hearts of hay growers although it is a little late in the season.

California Wire Cloth Corp. of South San Francisco, received a permit to make a 20,000 sq ft addition to its plant for the production of wire cloth, mesh, stucco netting and bale ties. Five buildings with corrugated steel roofing and siding will be erected within the next 60 days at a cost of approximately \$40,000.



OFFICIALS of U. S. Steel visit the West Coast. At left, Dan Wollam, long-time employee and electrician at the Pittsburgh, Calif., plant of Columbia Steel Co., is introduced to Irving S. Olds, board chairman of U. S. Steel, while William A. Ross, Columbia president, looks on. P. D. Shoenberger, rolling mill superintendent, does the honors. At right Frank Benko, finisher on the Morgan rod mill, with more than 20 yr service with Columbia, discusses production problems with Benjamin F. Fairless, president of U. S. Steel. Having labored in steel plants himself, Mr. Fairless can and does talk labor's language when the opportunity affords.

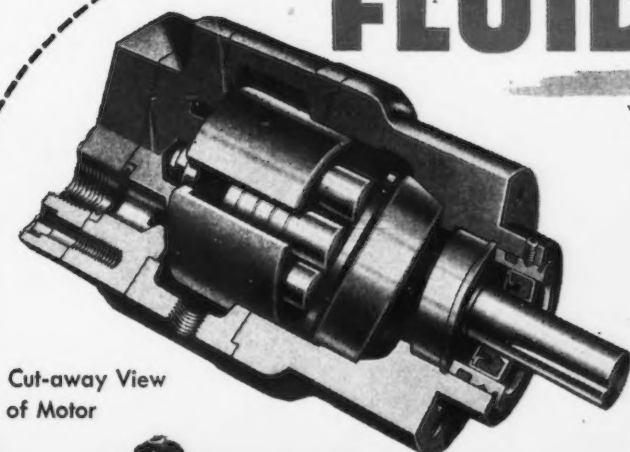




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An exclusive feature of these fluid motors is the unique "floating drive" construction. It provides *constant pressure contact* between the driving and driven elements *without mechanical linkages of any kind!* Sudden starts, stops or reversals can't cause distortion or breakage; destructive backlash or inertia is eliminated.

Equipped with speed control, the motors may be pre-set to operate constantly at any speed within their capacity, and that speed may be increased or reduced as desired while the motor is in operation.

Quick speed-up for rapid-traverse needs is provided by a plunger device interlocked with the speed-control valve. It permits instant acceleration from any pre-set speed to full-speed operation, for any desired interval. Releasing

the plunger causes the motor to resume its pre-set speed.

The motors may be stopped, started or reversed at any time without affecting their speed setting or the operation of the speed-up control. Motors are also fully self-starting from any stopped position. The plunger may be activated by lever, cam, or linkage arrangement (not included with speed control valve assembly).

The motor itself operates in a bath of oil, and normal slippage provides continuous circulation of oil through the gear-box—the entire unit is completely self-lubricating. Helical gears assure smooth, quiet operation and minimum wear.

Denison HydrOILic Fluid Motors are compact, ruggedly-built units in 3 and 5 h.p. sizes, available with or without speed-control valve and gear-head drive. Gear ratios—1:3, 3:1, 1:1.5, 1.5:1. Write for complete details!

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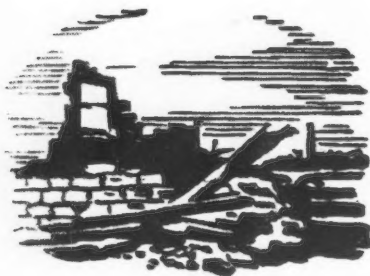
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# European Letter . . . JACK R. HIGHT

• Irish Steel Co. readying second openhearth project . . . Expansion of product line to be slow development . . . Government assistance now held in abeyance.



**H**AULBOWLINE ISLAND Cobh Harbour, Ireland—Following a series of setbacks largely due to the war, the modest production program of the Irish Steel Co. Ltd., on this site is just now beginning to bear fruit. The first 35-ton openhearth furnace was put into operation in July, and the merchant bar mill which has operated spasmodically since the plant was conceived in 1939 is in regular one-shift operation. The company was conceived as a private effort in 1937 to utilize available scrap supplies and reduce the tonnage of steel imports required for Ireland. Although considerable amounts of machinery arrived at the site, certain material shortages and other production problems have retarded the development of the new works.

The mill is located in a section of the buildings which formerly were a part of the British naval base which occupied the entire island. There are deep water docks immediately adjacent to the mill, but aside from these the natural geographical advantages are limited. All of the coking coal for the Irish production must be imported, although at the present time most of it is arriving from stocks that were built up in Ireland in previous years. Most of the scrap upon which the mill depends is shipped

by small schooners from the Dublin region, but at a cost which is somewhat above the current British scrap price.

The original effort at establishing an Irish steel industry before the war included an ambitious program to develop at this site a wide range of products which would render Ireland largely self-sufficient in regard to its limited steel requirements. As the original firm was forced into a receivership, and a succession of managers has placed the present group in a position where they have an uphill battle to fight. I found the men operating the works extremely cautious in regard to their plans for the future.

**T**HE receivers of the original firm entered into negotiations with the Irish Government to obtain funds for the completion of the works and secured an \$800,000 trade loan for this purpose. Considerable additional money will be required to put into operation the machinery which is now available at the site. In an effort to maintain some production, however limited, there has been unfortunately a certain amount of "cannibalizing" done to rolling mills which are on the site but which have never been set up.

The rolling mill equipment is of Krupp manufacture and of fairly modern design although it was built for a Belgian mill and was removed to Ireland after this mill had shut down. German technicians were to have established the mill and put it in operation, but the war changed all of these plans. The mill was closed down completely from 1940-43, but the merchant bar mill operated as raw material was available from 1943 until this year when the first openhearth was put into operation.

The only supplies available to Ireland were limited tonnages of Canadian billets, and total production for this works for the entire war period amounted only to about 6000 tons of merchant bar products.

**W**ITH a single openhearth operating only during the last six months of 1946, and during that period only on the basis of one heat a day, this year's production will amount to only a small percentage of the 5000 tons ultimate

production which the stock prospectus called out for this works. In line with its policy of taking as cautious a tone as possible, the managers today simply express the hope that 1947 will see 15,000 tons of production from the merchant bar mill, utilizing a second heat from the openhearth.

The number two openhearth is scheduled for completion in about a month's time and should offer considerable advantages as a standby unit, although a skilled labor supply is at present the controlling factor on production. A skeleton crew of about ten skilled men, mostly Englishmen with production experience with Tata in India and in the new Turkish national steel mill, are working in the steel plant and the rolling mill crew will probably be fortified with similar importations in the near future. From this nucleus a body of skilled Irish labor is being developed which it is hoped will soon make possible an additional shift in the rolling mill as well as in the openhearth.

The prewar plan for the company called for a bar and billet mill and a sheet and tinplate mill to supplement the merchant bar mill production. The machinery required is available in the plant except for what has been, as above mentioned, "cannibalized," but today's managers are hazarding no guesses as to when they may be in operation. The answer probably depends upon the willingness of the Irish Government to furnish additional funds for the installation and it seems likely that the government's attitude today is extremely cautious. The Dublin Government is still as anxious in 1946 to have a steel industry of its own as it was in 1938, and is probably willing to offer generous assistance to bring about its dreams.

The Irish Government, however, prefers not to be directly in the steel business, but is anxious to have a steel company capable of managing its own affairs as an entity outside the government. The attitude then is that Irish Steels Ltd. must get the open hearths and the bar mill on a sound economic footing before assistance will be forthcoming. If the delicate political factors to which all such government-industry negotiations are so sensitive do not interfere



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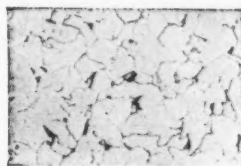


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*Housing for generators and motors may be thinner and lighter when made of Globeiron. The shell of the Dynamotor shown here is an example of Globeiron adaptability.*



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★ GLOWELD WELDED STAINLESS STEEL TUBES ★ SEAMLESS STAINLESS STEEL TUBES

the company will probably be able by late 1947 to make substantial progress in expanding its product line. Until it is possible to put into wider use the large investment in machinery which is rusting here in the sea air the company will remain in straitened circumstances.

The customs duty of 37½ pct (25 pct Empire) which the government applied in 1938 to benefit the firm is still effective, and the company is confident that it will remain.

THE domestic scrap supply is protected by an export regulation which gives Irish Steels the option of purchase on every ton of Irish scrap before it may be exported. Thus every scrap producer calls the plant to outline what he has on hand, and if the local firm needs it, the material cannot be exported. Opinions vary somewhat as to the continued availability of the domestic scrap supply in sufficient volume to fulfill the local needs. Some executives feel that Ireland produces at least 30,000 tons per year and perhaps more, and that this supply will continue, while others are less optimistic and foresee a possible situation where Ireland may become a modest importer of scrap.

With a serious national shortage of coal, supplies are carefully controlled and rationed by the government, and I was interested to view the coal bunkers under such circumstances. With one gas producer feeding a 35-ton openhearth and a coal fired reheating furnace in use in the rolling mills, there wasn't enough coal in the two bunkers together to heat a five-room bungalow through a Gary winter. A schooner with the next coal supply was expected at any moment, but a last minute check with the harbor commissioners indicated that it had not made its position known, and the rolling mill superintendent resigned himself to closing down for the afternoon.

In the absence of a blooming mill, a small size ingot is being cast that can be handled directly by the merchant bar mill, but the installation of the blooming mill will be the next item of the construction program.

As may be imagined, under the change of circumstances already described, costs for the plant have been high, and present production is being sold on the basis of a

uniform \$116 per long ton delivered price in any part of Ireland. This price roughly corresponds with the basic price for British imports with the customs included. The firm hopes to be able to maintain its present operations without in-

creasing existing prices, and is working toward a long-range aim of substantial reductions, although the size of the market and the necessity for importing coal will keep costs above the largest world levels.

## European Coal Mines Start Recovery; World Shortage Hits Imports

Pittsburgh

• • • Coal production in countries of Europe that were subjected to the ravages of war seems to be slowly getting under way, according to the United States Dept. of Interior reports. The average daily production in France during June totaled some 179,000 tons a day. Coal mines within the present borders of Poland consist of the Polish mines of 1939 plus the German mines situated in German Upper and Lower Silesia. It is estimated that during the war and early in 1944, production of the mines was at a rate of 112,000,000 tons a year. Slave labor, depletion of machinery, lack of machinery repair and the German practice of robbing handy reserves to extract the maximum of coal with disregard for preserving the pits left these mines in bad shape.

While figures for 1946 are not available on Polish coal output, from VE-Day in May, 1945 production climbed appreciably during the balance of the year. May 1945, output was 1,495,000 tons to a peak of 3,487,000 tons in November, 1945, and 3,268,000 tons in December 1945. It is assumed that production increased during 1946.

According to advice from the United States Embassy at Rome, Belgium and Italy have signed an agreement calling for the maximum exchange of 50,000 Italian miners for 3,000,000 tons of coal annually. The agreement is a sliding scale arrangement, providing for Italian purchases according to the number of Italian workers in Belgian mines and on the total mine production. The difficulty apparently is that Italy doesn't have 50,000 miners. A few thousand have been sent, but most have had no mining experience and it is felt that some of them will not be satisfactory.

Netherlands coal production has

shown a steady recovery since liberation, both in total production and output per manhour. Output gained from 448,000 tons a month in July 1945, to 700,000 tons a month in June 1946. A commission of inquiry is expected to investigate the desirability of nationalizing the mines of the Netherlands.

The control of the only coal deposit in the American sector of Austria has been restored to the Austrian Government by the American Occupation Forces, and output in March was reported by *Iron and Coal Trades Review*, London, to be 57,000 tons.

The shortage of coal throughout the world has cut sharply the imports of European nations. Based on the average monthly imports of 1935 to 1938, May 1946, imports for the European nations were as follows: France, 31 pct; Netherlands, 30 pct; Belgium, 56 pct; Denmark, 56 pct; Norway, 53 pct; Finland, 48 pct; Italy, 23 pct; Portugal, 26 pct; Sweden, 46 pct; and Switzerland, 47 pct. The main contributors to the European solid fuel requirements were the United States, the United Kingdom, and western Germany.

## Allocates 51 Factories

London

• • • A further 51 government-owned factories have recently been allocated by the British Board of Trade to industrial firms. They represent floorspace of about 3 million sq ft and when in full production should provide employment for up to 16,000 people. These include seven factories which have been allocated for a short term only.

In all, 256 government factories with an area of about 54 million sq ft have now been allotted to private industry or to use by the government for training and research centers and disposal depots. Employment is expected to be provided in them for between 300,000 and 400,000 people.

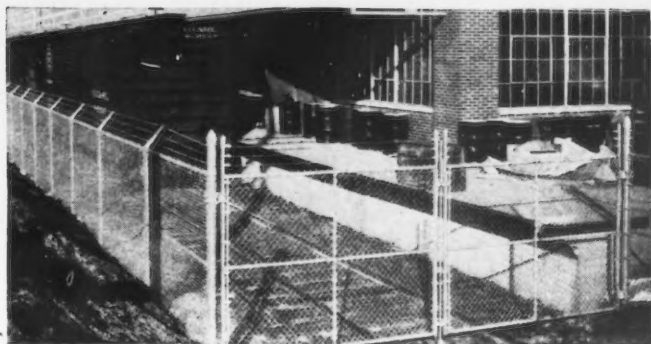


# CONTINENTAL KONIK<sup>★</sup>

## THE FENCE FABRIC WITH A FUTURE!

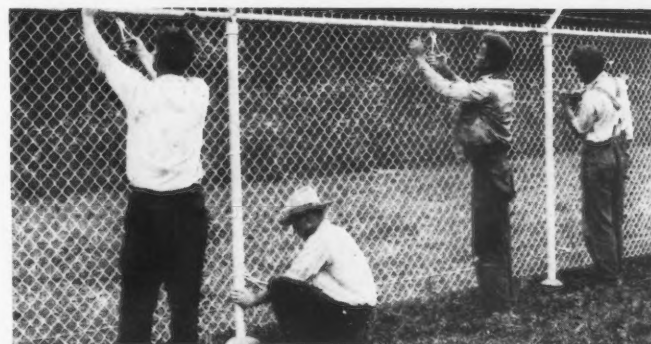


### ENGINEERED FOR PROTECTION



Continental fence has 14 distinctive construction features including heavier line posts . . . stronger and more easily operated gates . . . improved pivot-type hinges . . . self-locking barb arms . . . full gage wire of KONIK steel . . . fastened with 20% more ties.

### TAILORED TO FIT YOUR PROPERTY

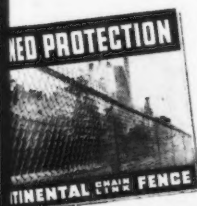


Experienced fence engineers plan and help erect Continental Chain Link fence. They work with you in laying out the most effective and economical installation to harmonize with the character of property, and to provide the type of protection you need.

★ TRADE MARK REG. U. S. PAT. OFF.

#### SEND FOR YOUR FREE COPY

Get a copy of "Planned Protection," a complete manual on modern protection and control of property. Phone the nearest sales office or write—



**CONTINENTAL  
STEEL**

# CONTINENTAL STEEL CORPORATION

GENERAL OFFICES • KOKOMO, INDIANA

PRODUCERS OF Manufacturer's Wire in many sizes, gauges, tempers and finishes, including Galvanized,

KOKOTE, Flame-Sealed, Coppered, Tinned, Annealed, Liquor Finished, Bright, Lead Coated, and special wire.

ALSO, Coated and Uncoated Steel Sheets, Nails, Continental Chain Link Fence, and other products.

- **George P. Eichelsbach, Jr.**, who began with the American Stove Co., Cleveland, in the St. Louis plant in 1935 as an engineering draftsman and became successively chief engineer of the St. Louis division and chief engineer of the entire company, has been elevated to director of manufacturing and engineering.

- **Chester H. Kimmel** has been appointed manager of the Camshaft and Crankshaft Divs. of the Ohio Crankshaft Co., Cleveland. Mr. Kimmel, formerly factory manager of TOCCO's Crankshaft and Camshaft Div., was with Packard Motor Co. for 6 yr prior to joining the company. **Morgan R. Kavanagh** has been appointed factory manager of the divisions, succeeding Mr. Kimmel. Mr. Kavanagh, formerly vice-president and production manager of Oliver Iron & Steel Corp., joined TOCCO in 1944. He has been manager of the new products division.

- **Harry Carnick** has been named credit manager of the Copco Steel & Engineering Co., Detroit.

- **Fayette Leister** has been elected to the office of vice-president in charge of engineering of the Fafnir Bearing Co., New Britain, Conn. He has been identified with Fafnir since 1921 and was made engineering manager in 1945.

- **Dr. C. K. Bump** and **H. W. Mohrman** have been appointed assistant directors of research, plastics division, Monsanto Chemical Co., Springfield, Mass. Dr. Bump has been research chemist in the Springfield plant since 1937. Mr. Mohrman entered Monsanto service in 1939. **Edmund D. Kennedy** has been appointed sales promotion manager of the division. For the last 2 yr he has served as sales promotion manager of the Vickers Div. of the Sperry Corp., Detroit, and prior to that was sales promotion and advertising manager of the Copperweld Steel Co.

- **Richard M. Joslin** has been appointed manager of the Detroit office of Carbide & Carbon Chemicals Corp. He replaces **George D. Garrett, Jr.**, who is joining Carbide & Carbon Chemicals, Ltd., Toronto, Canada.

## PERSONALS

• • •

- **H. E. Slocum**, director of chemical laboratories for the Jones & Laughlin Steel Corp., has retired after 49 yr service with the corporation. Mr. Slocum was associated with the Carnegie Steel Co. and National Tube Co. before coming to Jones & Laughlin in 1897 as a chemist at its Pittsburgh works. In 1914 he was appointed chief chemist of the Pittsburgh Works and in 1936 was made director of chemical laboratories.



C. EDWARD PRICE, president, Peninsular Grinding Wheel Co.

- **C. Edward Price** has been elected president of the Peninsular Grinding Wheel Co., Detroit. He joined Peninsular 11 yr ago as sales manager and was later named vice-president in charge of sales.

- **O. L. Arnold** has been made president of Nash-Detroit Co., Detroit. Mr. Arnold was formerly assistant general sales manager of Nash Motors.

- **Robert L. Bartley** has been named sales manager of the tank division of Gar Wood Industries, Inc., Detroit. For the past 12 yr he was sales engineer of the division.

- **Bruce W. Schafer**, for the last 3 yr traveling sales engineer, has been appointed manager of the sales and service department of the Detroit Electric Furnace Div. of Kuhlman Electric Co. in Bay City, Mich. Previously, Mr. Schafer served for 4 yr in the magnesium research department of the Dow Chemical Co. Assisting Mr. Schafer in sales engineering in the field is **Charles V. Kilburn**, new head of the research and engineering department of Detroit Electric Furnace Div. Mr. Kilburn's appointment comes after 7 yr service as design engineer.

- **Howard P. Atkin** has recently become a member of the cathodic protection sales staff of the Dow Chemical Co. with offices in Los Angeles, and **Ray H. McLeod** has joined the cathodic protection sales staff with offices in Chicago. **John W. Mighton** has become associated with the magnesium sales staff of Dow Chemical Co. and is attached to the Midland office.

- **C. G. Murphy** has been appointed parts merchandiser for Hudson Sales Corp. at Los Angeles, a division of Hudson Motor Car Co.

- **H. R. McLaren**, former superintendent of tube mills, has been promoted to assistant general superintendent of the Steel & Tube Div., the Timken Roller Bearing Co., Canton, Ohio, succeeding **Gilbert Soler**, who recently resigned. Mr. McLaren joined Timken in 1930 as piercing mill superintendent in the Steel & Tube Div. and later was named superintendent of tube mills. Prior to that he was superintendent of National Tube Co.'s seamless tube mills at Lorain and general foreman of its hot mills at Ellwood City, Pa. **J. P. Wargo** has been appointed to succeed Mr. McLaren as superintendent of tube mills and **R. R. Elsasser**, who was manager of Timken's wartime plant at Newton Falls, replaces Mr. Wargo as assistant superintendent of tube mills. Mr. Wargo joined Timken in 1936 as inspection engineer after serving as superintendent of the finishing department for National Tube Co. Mr. Elsasser came to Timken in 1935 as sales trainee and member of the steel sales force, entering the inspection engineering department in 1942. He went to Newton Falls as plant manager in 1944.



## PERSONALS

• **Arthur P. Shanklin** has been appointed vice-president and general sales manager of Carrier Corp., Syracuse, N. Y. Effective Nov. 1, Mr. Shanklin will be in charge of all of Carrier's domestic sales activities. A vice-president of Carrier Corp. since 1941, he has been associated with the company since 1922. During this period he has served in many sales and executive capacities and at present is vice-president in charge of dealer sales.

• **George W. Altman**, recently released from active duty with the Army, has joined the foundry staff of the Lennox Furnace Co., Columbus, Ohio. Prior to entering service, he was foundry engineer for Pittsburgh Coke & Iron Co.

• **James G. Mowry** has retired after 45 yr association with the Pittsburgh Plate Glass Co.'s paint division, Pittsburgh.

• **Homer A. Size** and **Arthur X. Nelson** have been appointed representatives of the industrial division, Bryant Heater Co., Cleveland. Mr. Size will represent the division, in California and Mr. Nelson will serve the Minneapolis area. Mr. Size was formerly associated with the Michigan Consolidated Gas Co., Bohn Aluminum & Brass Co., and has been a partner and manager of Immersion Heating Equipment Co., which association he will continue. Mr. Nelson has just completed 3 yr with the Navy. Prior to entering the service, he was associated with the Minneapolis Gas Light Co. He operates Plant Equipment, Inc., Minneapolis.

• **Thomas Cruthers** has been elected a member of the board of Electric Machinery Mfg. Co., Minneapolis, a subsidiary of Worthington Pump & Machinery Corp. Mr. Cruthers is a vice-president of Worthington at Harrison, N. J.

• **R. D. Houghton** has been appointed general manager of the industrial machinery division of the Milwaukee Chaplet & Mfg. Co., Milwaukee. He was formerly associated with the Chain Belt Co. as an export executive.



WILLIAM J. KERR (left), vice-president in charge of production, and NORBERT C. RUBIN (right), vice-president in charge of sales, Yoder Co.



• **William J. Kerr** has been appointed vice-president in charge of production, the Yoder Co., Cleveland. Formerly factory manager, he joined the company in 1936 as production manager, coming from the Worthington Pump & Machinery Corp. in Cincinnati and later in New York, where he was industrial engineer. **Norbert C. Rubin** has been named vice-president in charge of sales of the Yoder Co. Mr. Rubin, formerly sales manager, was engaged in engineering special equipment for McKinney Tool & Mfg. Co. prior to his affiliation with the Yoder Co. in 1939.

• **John L. Gillis** has rejoined Monsanto Chemical Co., St. Louis, having left Johnson & Johnson International, New Brunswick, N. J., where he served as vice-president. Mr. Gillis was formerly connected with Monsanto in the foreign dept. as general export manager and assistant director, prior to leaving in 1944 to go with Johnson & Johnson.

• **Earnest V. Haines** has been appointed head of the newly-created patent dept. of International Minerals & Chemical Corp. He will work at the Chicago headquarters of the company under Dr. Paul D. V. Manning, vice-president in charge of the research division, and will handle all details relating to patent developments for the corporation.

• **Harry H. Chandler** and **Clara V. Tyler**, who organized Construction Reports, Inc., and have served until recently as president and vice-president of the company respectively, have become associated with the construction news division of F. W. Dodge Corp., with headquarters in Boston. **Norman F. Benbow** has been appointed special sales representative of F. W. Dodge, with headquarters in Buffalo. He has been associated with the National Gypsum Co. since 1928, for many years as Buffalo sales manager and during the last 2 yr as sales training director.

• **D. W. McNaugher, Jr.**, vice-president, has also been appointed treasurer of the Robert W. Hunt Co., Chicago. **S. C. Sexauer**, assistant secretary, has been appointed secretary.

• **Harold N. Ewertz** has been appointed sales manager of the electrode division of the McKay Co., York, Pa. He had formerly been associated with the Arcos Corp. as a sales manager. Prior to that he was welding engineer and sales manager of Austin-Hastings Co.

• **Elmer G. Davis** has been appointed sales manager of the recently formed Buckeye Div. of General Grinding Wheel Corp., with his headquarters in Cleveland.



**ABIJAH U. FOX**, whose appointment as chairman of the board of directors, Mathieson Alkali Works, Inc., was announced in last week's issue.

• **Homer W. Derby** has been appointed works accountant of General Electric Co.'s new laminated plastics factory at Coshocton, Ohio. Mr. Derby has been serving in a similar capacity at the Lynn plastics factory, which is in the process of being transferred to Coshocton. He joined the plastics divisions in 1933 and was made works accountant in the Lynn plant in 1940.

• **James G. Graham** has been appointed district manager of the railroad division of Fairbanks, Morse & Co., with headquarters in Chicago. He had been associated with the J. G. Brill Co. of Pittsburgh, the Baltimore & Ohio R.R., the New York Central R.R., and was general manager of railroad sales of the Oliver Iron & Steel Corp.

• **William J. Pulte**, sales executive for the Wisconsin Screw Co. of Racine, Wis., died suddenly. He formerly was employed in the purchasing department of Packard Motor Car Co. and at Briggs Mfg. Co.

• **George Feucht**, 66, a retired structural draftsman and designing engineer for the Jones & Laughlin Steel Corp., Pittsburgh, died Sept. 19. He had been with the steel firm for 38 yr.

• **A. W. Larson** has been promoted to manager of lighting and distribution apparatus, agency and specialties sales department, of the Westinghouse Electric Corp. Mr. Larson, who has been a lighting engineer for the company's northwestern district in Chicago, will make his headquarters in East Pittsburgh.

• **Harry A. Walker** has been named plant engineer of Goodyear Tire & Rubber Co.'s plant in Lecheria, Mexico.

• **Clyde O. DeLong** has been named merchandise manager of the industrial products sales division of the B. F. Goodrich Co., Akron, Ohio, succeeding **Fred A. Lang**, recently appointed general manager of a newly created shoe products sales division. Mr. DeLong, with the company since 1928, had been manager of sundries sales for the last 3 yr. He had previously been operating manager of the industrial products sales division, as well as handling various sales positions.

• **Henry Hillerman** has been appointed sales manager of Modern Collet & Machine Co., Ecorse, Mich. **Allen W. Lovell**, former sales manager, has been appointed general manager. Mr. Hillerman was with Modern Collet's sales force and was assigned the Michigan territory, except Detroit and Pontiac. Mr. Lovell joined Modern Collet in 1944 as sales manager, following positions as plant superintendent of SKF Industries, superintendent of bearing production with Jack & Heintz, and management engineer with Booz, Allen & Hamilton.



**ARTHUR ZIMMERMAN**, sales manager, Steel Improvement & Forge Co.

• **Arthur Zimmerman** has been appointed sales manager of the Steel Improvement & Forge Co., Cleveland. Mr. Zimmerman was formerly associated with the Weatherhead Co., Cleveland, as assistant chief engineer, and lately had been active in sales and engineering work in connection with gas turbine accessories.

• **Herbert C. Graves, Jr.** has been appointed chief engineer for Gibson Electric Co., Pittsburgh. Previous to joining the company, he was engineering manager for I-T-E Circuit Breaker Co. and, during the war, was in charge of Navy activities for that company.

• **Haldimand S. Putnam, Jr.** has been made assistant treasurer of the Package Machinery Co., Springfield, Mass.

• **John A. Williams**, general superintendent, Geometric Stamping Co., Cleveland, died of a heart attack Sept. 19.

• **C. W. Seiberling**, 85, first vice-president of the Seiberling Rubber Co. and one of the founders of the Goodyear Tire & Rubber Co., Akron, Ohio, died Sept. 20.

• **Joseph W. Cotlin**, 46, an engineer of the American Cast Iron Pipe Co., Birmingham, died Sept. 18.

## ...OBITUARY...

• **Ralph B. McKinney**, 58, general manager of the paper makers chemical department and member of the board of directors of Hercules Powder Co., Wilmington, Del., died Sept. 21 after 2 weeks' illness. He had been associated with Hercules since its organization in 1913 when he became a member of the company's purchasing unit.





## MOTOR MANUFACTURER *Normalizes 3 Times More* GRAY IRON CASTINGS!

... With  $\frac{1}{3}$  The Furnace Equipment

... In 45% Less Floor Space

... At 16% Saving in Fuel

**WHO?**  
**WHERE?**  
**WHEN?**  
**WHAT?**

Wisconsin Motors Corporation  
Milwaukee, Wisconsin

From September 1945 to present

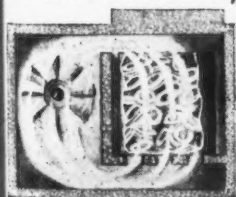
- (1) Stepped-up daily heat treating production from 13,000 pounds of gray iron castings and forgings to over 40,000 pounds.
- (2) Used 45% less floor space, — 780 square feet as compared to 1400 square feet. (Including loading space for both furnaces.)

**HOW?**

By replacing 6 conventional box-type furnaces with two Lindberg Super Cyclone pit type furnaces.

With two Super Cyclones, production zoomed from 12,912 pounds to 40,803 pounds for each 24 hour period.

*This increase is possible because:*



**V** Castings reach heat quicker, heating cycle is reduced from 6 to 2½ hours. Faster, more accurate heating is possible thru using 100% Forced Convection Heating. The powerful Super Cyclone blower fan forces accurately heated air thru every part of the charge. All parts heat at the same time. No lag. No overheating of outside and underheating of middle.

**V** Super Cyclones are never tied-up while castings cool in the work chamber. Basket handling permits castings to be removed from the furnace for cooling. Thus the Super Cyclone can immediately go to work on another charge of castings. This time saving was not possible with the conventional box type furnaces which were tied-up for hours while the work cooled in the work chamber.



**V** Castings are handled more easily by using work baskets that are loaded and unloaded away from the furnace. With the conventional box type furnace, castings had to be tediously loaded and unloaded in and out of the horizontal work chamber.

The Super Cyclone in addition to heating quicker, permitting easier loading and unloading of work, and permitting cooling of castings away from the furnace, also operates at a 16% saving in fuel.

Perhaps there's an application for a Super Cyclone in your foundry. Bulletin 130, "Lindberg Super Cyclone" is yours for the asking. Lindberg Engineering Company, 2452 West Hubbard Street, Chicago 12, Illinois.

# LINDBERG FURNACES

# Dear Editor:

## GERMAN DEVELOPMENTS

Sir:

In an August issue under "German Wartime Technical Developments," there is listed report PB-22825 on protective coatings for metal parts. Can you tell me if this report is written in English or German?

GUY J. SPEAR

Cumberland Steel Co.  
Cumberland, Md.

● Reports listed under that title are prepared by various American technical observers and are written in English. Occasionally floor plans or machine blueprints attached to the report are photostats of originals taken from plants in Germany and are labeled in German and carry metric dimensions.—Ed.

## CONVERTED WELDER

Sir:

Kindly inform us if it is possible to convert a Sciaky press-type resistance spot welding machine, type PMCO-2S41A, 60 kw, into a spot welder to weld steel. If it is possible, what changes would be necessary and please advise if there is any source in Detroit vicinity who could make these changes.

E. CONDAK

Mardigian Corp.  
Detroit

● Sciaky engineers advise that the machine you mention will weld corrosion resisting steels up to the same capacity as aluminum (0.093 plus 0.093). Recommend you contact the Detroit office of Sciaky, 442 New Center Bldg., for full details.—Ed.

## ALLOY ROD PIANO

Sir:

Please advise us the name of the manufacturer of the piano with alloy rods illustrated on p. 108 of the Aug. 8 issue.

H. F. ROTH  
Purchasing Dept.

Girdler Corp.  
Louisville

Sir:

In the Aug. 8 issue, on p. 108, you show a piano using alloy rods. Can you give us information as to who is manufacturing this piano and who has the sale of it?

C. F. LOZON  
President

Mfg. & Tool Corp.  
Burlington, Vt.

● That midget piano featuring alloy rods, was developed by an elusive ex-GI named R. Osbrink. Our Eastern operatives have trailed him to Los Angeles, where the trail has been picked up by our West Coast staff. We hope shortly to have complete information on this piano, which has stirred up a great deal of interest among our readers.—Ed.

## STRESS SYSTEM

Sir:

We have reference to the July 4 issue, p. 51, on which the following Newsfront item appears, "New approach to the problem of fatigue failure is a theory based on effects of the three-dimensional stress system acting on an elementary subsurface particle to produce shearing stresses and strains." Please advise where we may obtain further details on this.

D. B. LECTURE

Brown Instrument Co.,  
Philadelphia

● The news front item was based on a paper entitled "Metallographic Observations of Ball Bearing Fatigue Phenomena," by A. B. Jones, New Departure Div., General Motors Corp., Bristol, Conn., presented at the ASTM annual meeting at Buffalo earlier this year. This interesting study was abstracted in a report of the ASTM meeting published in THE IRON AGE [see p. 74, July 4].—Ed.

## POWDERED IRON

Sir:

Can you refer me to a source for experimental quantities of powdered iron made by the carbonyl process?

PAUL C. BAKER

Port Neches, Tex.

● Sole producer is General Aniline & Film Corp., 270 Park Ave., New York.—Ed.

## X-RAY DIFFRACTION

Sir:

We would appreciate further information on the article "X-Ray Diffraction Studies of Electrodeposits," which appeared on p. 61 of the July 25 issue. Can you tell us where we can obtain a reprint of the article in its entirety.

S. KATZ  
Chief Chemist

Conmar Products Corp.  
Newark, N. J.

● The report appearing in the July 25 issue was an abstract of a paper presented at a recent meeting of the American Electroplaters' Society. We suggest you get in touch with Dr. A. K. Graham, executive secretary of the Electroplaters' Society, 471 York Road, Jenkintown, Pa.—Ed.

## VACATIONS, 1946

Sir:

The writer is a reader of your publication and would appreciate receiving three reprints of the article from the London Economist entitled "Vacations 1946," which appeared in the issue of Aug. 29.

T. H. BATEMAN

W. H. S. Bateman & Co.  
Philadelphia

## LOW SULFUR STEEL

Sir:

In the issue of Aug. 1 in "Newsfront" the statement is made that "development of a process for the production of steels with low sulfur and phosphorus content during the war enabled the Germans to save alloying metals, etc." Can you advise me where this statement originated and if possible refer me to where added information may be obtained regarding the mechanism of producing these low phosphorous and sulfur steels?

W. J. REAGAN

Associated Professor of Metallurgy  
Pennsylvania State College  
State College, Pa.

● The statement was based on a report prepared for the Office of Technical Services, Washington, on German wartime metallurgical developments. Photostat copies of the report are available from OTS at a cost of \$10. The report is identified as No. PB-16720.—Ed.

## WELDING PRECIOUS METALS

Sir:

May we please have tear sheets of the article on p. 59 of the Aug. 22 issue, namely, "Welding Precious Metals" by F. W. Meyers, Jr.

E. P. HATCH

Metals & Controls Corp.  
Attleboro, Mass.

## MACHINE PRESERVATION

Sir:

The article in the Aug. 29 issue entitled "Plastic Film Assures Safe Storage and Shipment of Machinery," proved to be very interesting. We would appreciate any further information that you have available in regard to this plastic film. In a footnote you refer to an Apr. 18 issue which set forth the Navy's anticorrosion program. If this articles ties in with the one previously mentioned, we would appreciate it very much if you would send us a copy of the Navy report.

A. J. LIEBMAN  
Research Engineer

Dravo Corp.  
Pittsburgh

● Further details of the process described in the Aug. 29 article may be obtained from R. M. Hollingshead Corp., Camden, N. J. Additional information on the Navy program, described in the Apr. 18 issue, may be obtained from the Navy Preservative Laboratory, at the Philadelphia Navy Yard.—Ed.

## INDUCTION HEATING

Sir:

Kindly let us have two copies of the article entitled "Problems in High Frequency Induction Heating," which appeared in the July 18 issue.

D. A. WILSON  
General Purchasing Agent

Canadian Westinghouse Co.  
Hamilton, Canada





First step to BEAUTY IN A CASTING

# Wheelabrate IT FIRST TO IMPROVE FINAL FINISHING

To LOOK its best and to SERVE best the finish applied to a product must be of perfect quality.

The critical factor is well-prepared, perfectly clean surface that will anchor the final finish in a permanent bond.

Many important processors place their complete dependence upon Wheelabrator airless blasting for this exacting operation, because comparative performance tests have proved it to be the surest and quickest way to the end-result desired.

A test on your products would provide perfect evidence of how this modern blast cleaning process can benefit you. May we arrange such a demonstration soon?

## ENAMELING

Improved by WHEELABRATING

Sanitary ware, including bath tubs, sinks and miscellaneous small pieces, are Wheelabrated prior to enameling in the plants of leading manufacturers. At one typical installation 120 large cast tubs, averaging 300 pounds each, are cleaned per hour in a Wheelabrator Monorail Cabinet. Uniformly and thoroughly cleaned, every surface of a Wheelabrated casting has the proper finish to anchor the enamel to the metal.

## PLATING

Improved by WHEELABRATING

The Callander Foundry & Mfg. Co., Guelph, Ontario, Canada, operates a complete electroplating plant in connection with their foundry. They put through an average of 2000 lbs., of cadmium-plating per day. These castings are all Wheelabrated in a 36" x 42" Wheelabrator Tumblast, which has been a big improvement over former methods. This concern advises that the matte finish obtained by Wheelabrating provides a perfect bond for plating.

## GALVANIZING

Improved by WHEELABRATING

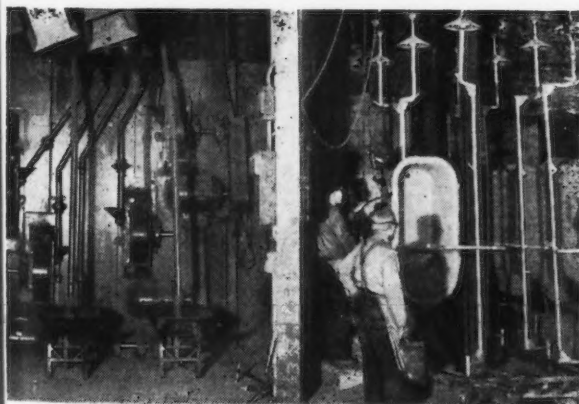
Malleable iron pipe fittings are all galvanized directly after Wheelabrating at The Walworth Co., Greensburg, Pa. Two 48" x 42" Wheelabrator Tumblasts clean their entire production of fittings. The usual load for each machine is about 1700 pounds. Castings weigh from 4 ounces to 75 pounds apiece. Cleaning time for the larger fittings ranges from 4 to 5 minutes per load; for the smaller fittings 10 to 15 minutes per load. After Wheelabrating the fittings are dipped into zinc ammonia chloride, which acts as a flux. Following this they are galvanized.

## METALLIZING

Improved by WHEELABRATING

Aircraft engines that must be corrosion-proofed for sea-duty are metallized by Wright Aeronautical Corp. To obtain the correct bond for this operation the surfaces of the deep-finned cylinders are Wheelabrated in specially designed machines.

Wheelabrating is extensively used today for preparing metals for many other finishing processes as: Plastic coating, parkerizing, painting, lacquering, anodizing, etc.



**American**  
FOUNDRY EQUIPMENT CO.

510 S. Byrkit St., Mishawaka, Indiana

WORLD'S LARGEST BUILDERS OF AIRLESS BLAST EQUIPMENT

# This Industrial Week . . .

- **Steel Activity at More Than Normal Rate**
- **But Manufacturers Take Sober Attitude**
- **Unbalanced Inventories Receive Scrutiny**

**S**TEEL activity continued to swing along at more than a normal peacetime rate in spite of all the shortages and production difficulties. That some of the tension being forced upon the industry may soon be relieved to a small extent is reflected in a most recent, realistic attitude on the part of consumers that their production schedules must be gaged to steel shipments.

While pressure for deliveries continued this week, steel consumers as a whole have appreciated the necessity for delaying or revamping their 1947 production plans and have dispensed with the idea that somehow steel and other materials can be obtained to support a program entirely out of relation with available supplies.

Manufacturers in recent weeks have closely scrutinized their unbalanced inventories and to some extent show a serious concern over this situation. It can be expected that future orders will be concentrated on an attempt to obtain the materials which are in far shorter supply in order to balance out total stocks and thus produce finished products at an accelerated rate. Because most manufacturers are short of the same type of steel products, it may take several months before current manufacturing inventories can be leveled out into a balanced supply.

It is recalled in the trade that the same type of thinking took place in 1937 when many manufacturers were aghast at the magnitude of their unfinished stocks of steel. Today's conditions, however, differ sharply with that period because unfulfilled demand from the public is of far greater magnitude than existed in the Fall of 1937. Nevertheless the scrutiny of inventories, the stock market drop and the enforced increase in the price of many finished products because of higher costs has produced one of the most sobering influences apparent since the end of the war.

**S**TEEL companies report that most large manufacturing firms are maintaining their orders for equipment and materials covering the balance of this year, but are not committing themselves as to the amount of their steel quotas, which they will want shipped in 1947. Only one major steel company has opened its books for 1947 but most large consumers are fully aware of the proportion of steel output to which they will be entitled in that period.

Besides the scare of unbalanced inventories and the hesitancy of bankers in extending further credit in the case of many small companies, management is nervously watching for the possible renewal of labor disputes and for further evidence of weaknesses in the stock market. Continued price increases will serve to strengthen the present mood of restrained optimism (or restrained pessimism) among management. Postponement of steel deliveries which will by nature pre-

cede cancellation has already started on a very small scale but may increase soon in some areas.

The far reaching effects of isolated strikes are causing considerable concern in the manufacturing industries because of enforced curtailments at plants not even remotely connected with the tieups. The power strike at Pittsburgh, involving an independent union, not only closed down a considerable number of manufacturing plants but indirectly curtailed operations at a steel works and at an electrical equipment firm because of union sympathy walkouts.

While the Pittsburgh power strike has not yet affected the production of steel ingots it has to a limited degree curtailed the output of finished steel items. The 6-day walkout at Carnegie-Illinois Steel Corp.'s Gary sheet and tinplate plant caused a loss in production of 12,000 tons of tinplate and 24,000 tons of sheets. This was sad news to can makers and to other consumers who had looked forward to heavier fourth quarter shipments of these products.

**D**ESPITE the tendency displayed in recent weeks towards a closer control over steel order volume steel users are still placing business at a rate exceeding shipments. The present thinking does not involve what is currently considered to be postwar peaks in new business, but presumes to cover what may be conditions in the latter part of the first half of 1947. September figures are expected to reflect an exceedingly high volume of production and shipments and it is practically certain that barring unusual labor conditions October will establish a new postwar high.

Steel output this week remained unchanged at 90.5 pct of rated capacity and there was little indication that there would be much change in the immediate week ahead.

The controversy in the steel trade over the deterring effects of steel priorities was still present this week. There is no indication so far that priority assistance will be extended beyond the fourth quarter of this year. This question is expected to be settled when the CPA and steel producers meet in Washington on Oct. 8. The necessity for a directive on railroad car building material will also be discussed.

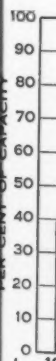
Some allocations of electric furnace scrap for openhearth consumption have been made recently, but the overall scrap situation remains substantially unchanged from what it was a few weeks ago. Scrap inventories are still at a low point and the volume of new shipments remains below expectations. Foundries which expected increased shipments of cast scrap after the recent price raise have been disappointed. They report that actually shipment of cast to melting units in some areas is even lower than it was prior to the raise in cast scrap quotations.

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• **ITALIAN STEEL DEAL**—Rome reports rumor of an Italo-American financial organization for joint control of the biggest Italian steel units. American producers, it is said, will guarantee supply of raw materials plus half manufactured goods at privileged terms granting deferred payment. Industrial quarters at Rome say Ford, A. P. Giannini of the Bank of America on the West Coast and also LaGuardia are involved. Despite lack of confirmation of this report Italian industry definitely must have outside financial assistance to assure participation in international markets. Possible Swedish investment previously reported is still conceivable.

• **BATTERY SHORTAGE**—Batteries currently present a major automotive headache. With the largest replacement demand on record plus the largest original equipment demand, the industry is faced with a growing shortage of lead. Unless the situation is corrected in the near future, a lot of automobiles are going to be out of commission after the first cold spell this fall.

• **IRON ORE CONSUMPTION**—U. S. and Canadian blast furnaces consumed 6,738,409 tons of Lake Superior district iron ore in August, an increase of 278,376 tons over July, bringing the 1946 total to 37,440,730 tons compared with 52,536,854 during the corresponding period a year ago, according to the Lake Superior Iron Ore Assn. The association's report showed 163 U. S. furnaces which depend principally on Lake Superior ore active on Sept. 1, and three Canadian, with 22 U. S. and seven Canadian furnaces idle. Iron ore stocks on Lake Erie docks and at furnaces on Sept. 1, amounted to 34,066,987 tons, compared with 34,781,382 tons on Sept. 1, 1945.

• **PING AND MORE PING**—The "ping" in millions of old jalopies being driven over the nation's highways is going to get louder in the near future because of the critical lead situation during May, June, July and August. Ethyl Corp. has been living largely on its inventories; it is also reported that the company got a bad break in the selection of the base period for determining allocations.

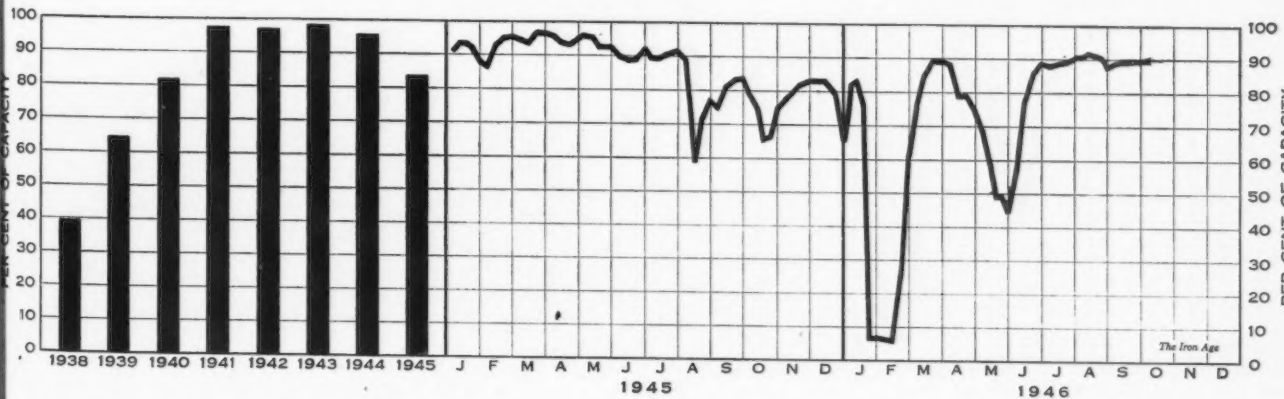
• **SUING OPA**—Keystone Steel Wire Co., Peoria, Ill., has entered suit against OPA in a move to block enforcement of part of the recent OPA Amendment controlling the sale and purchase of scrap. Keystone's petition, filed in the Federal Court at Peoria, is the first challenge of the Amendment's validity. The suit attacked "tie-in" prohibition of Amendment 8 to MPR4. The hearing, which took place Oct. 2, in the court room of the Federal Bldg. in Peoria, charged that the recent ruling made it necessary for Keystone to buy its scrap in the open market in competition with other buyers. Keystone said it would be unable to fulfill its winter needs if the ruling were enforced.

• **INTERRUPTED, NOT CANCELLED**—It is not proper to refer to "cancellation" of the light car programs of Ford, Chevrolet and Dodge. In each case, informed sources have pointed out that the projected programs have been "interrupted" and the programs will be revived, probably in modified form, as soon as there are positive grounds for believing that the basic materials situation is permanently improved.

• **WIRE PRODUCTS**—The general picture of wire products from a supply standpoint is still bad, but the situation is improving because of higher production. Light gage wire is running about 7 to 8 months on deliveries, mainly because integrated mills do not have sufficient drawing capacity. Nonintegrated mills, while they have drawing capacity, lack material. However, the integrated mills are using close to their peak on material, and are in a position of not being able to furnish more than is now going into the nonintegrated plants.

• **AUTO PARTS INDUSTRY STRIKES**—Reports received from 229 plants in the automotive and aviation parts industries employing more than 137,000 workers indicates that 38 pct of the 229 plants employing 73,400 workers have had 178 strikes resulting in the loss of more than 16,260,000 manhours of scheduled work. Of the 178 strikes, 94 were "quickies" lasting less than one day. The longest strike covered 115 scheduled working days and 84 of the 178 strikes lasted more than one day. Members of CIO unions were involved in 151 strikes and UAW (CIO) in 142 strikes.

Steel Ingot Production by Districts and Per Cent of Capacity



Week of	Pittsburgh	Chicago	Youngstown	Philadelphia	Cleveland	Buffalo	Wheeling	South	Detroit	West	Ohio River	St. Louis	East	Aggregate
September 24...	95.0*	91.5	87.0	82.0	85.0*	102.0	96.0	99.0	96.0	73.0	96.5	67.0	100.0	90.5
October 1.....	98.0	91.5	87.0	84.5	85.0	102.0	96.0	97.0	98.0	70.0	90.0	67.0	84.0	90.5

\* Revised.

# THE TURNER SYSTEM OF MATERIALS HANDLING

## *Cuts Costs—Increases Efficiency—Protects Dies*

with

### Scientifically Engineered Equipment

A complete line of specially built Turner System Racks, perfectly designed for better handling, protection and storage of all types of dies . . . offers you exceptional time and labor saving features. Each of these Racks fits on the TURNER TRANSPORT so the entire unit may be moved to any part of the shop where dies are removed as required. Racks may be mounted one on top of another for increased capacity or storage.

Trays may be formed on these Racks by wooden retaining strips, mitered at corners to fit inside of legs . . . or shelves may be inverted to form trays as shown in illustration at right.

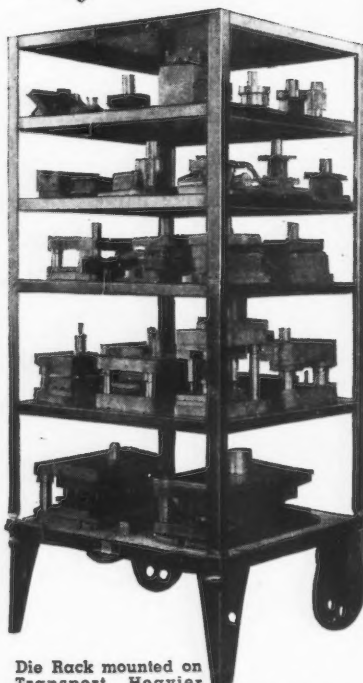
Dies or other materials on these Racks are fully protected yet always visible and easily accessible. The Racks will also accommodate heavily loaded shop boxes, jigs and tools so that machines may be serviced as the Rack is moved from place to place on the TURNER TRANSPORT.



Inverted Die Rack shelves form trays to hold materials. The Rack fits on the TURNER TRANSPORT for quick movement to or from assembly lines.



One of many Die Racks offered by the TURNER SYSTEM.



Die Rack mounted on Transport. Heavier dies are placed on two lower shelves — lighter dies on the three upper shelves.

**RUGGEDLY BUILT** — for Long, Hard Usage  
Turner Die Racks have all-steel, full-welded construction, with sturdy legs and heavy gauge steel shelves. They are built to last indefinitely under the hardest kind of usage. They will be saving you money and serving you satisfactorily years after their original cost is forgotten.

**SEND FOR CATALOG PAGES ON DIE RACKS**  
Turner Die Racks are completely described and illustrated on catalog pages now available. Write for them on your letterhead.

**60 DAYS FREE TRIAL** — In Your Own Plant  
In order to give you a working knowledge of the efficiency of the Turner System, we ship, at your request, an assortment of standard units on 60 DAYS FREE TRIAL. Use them two months. The trial costs you nothing except nominal transportation charges. Write today for this assortment. Complete information follows immediately.



With the Turner System you "DELIVER THE BIN AND SAVE THE HANDLING." Wooden-side or All-steel Bin Sections, Racks, Trays and Die Tables fit on the Turner Transport which is moved by hand "jimmy," power lift truck, crane or tractor.

# FACTORY SERVICE COMPANY

4621 NORTH TWENTY-FIRST STREET

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## Cement Case Seen Weakening FTC Stand on Steel Basing Points

### New York

• • • Although it cannot be expected that the Federal Trade Commission will relax its activity in attempting to force a change in the multiple basing point system used by the steel industry, the recent Cement Decision handed down by the U. S. Circuit Court of Appeals at Chicago which found against the FTC may possibly knock the props out from under a drive on the steel industry basing point setup.

The Circuit Court of Appeals finding at Chicago set aside the order of the FTC issued against the use of the multiple basing point system of marketing in the cement industry. This is said to be the first judicial decision made on this important subject.

The Circuit Court of Appeals, in vacating the Commission's orders, ruled that the FTC had not sustained its charges of conspiracy in the quoting of cement prices. The effect on the decision is said to permit the companies to continue to sell cement at delivered prices under a multiple basing point method if they so choose.

The basic arguments in this case are so similar to those applying to the steel industry that steel sources feel confident that the decision represents a substantial victory for industries other than cement companies.

For years the FTC has been studying the multiple basing point system in the steel industry and has many times disclosed that it would attempt to force an f.o.b. mill price system on the industry. Some of the arguments put forward by the FTC even at this late date are said to have been applicable to a set of conditions which has not prevailed in the steel industry for many years.

Steel observers have pointed out repeatedly that the great number of additional basing points for steel products, which have been established in recent years, indicates a competition far more rugged than any f.o.b. mill system could bring about.

Steel officials have pointed out that the imposition of an f.o.b. mill setup (the f.o.b. price plus

By TOM CAMPBELL  
News-Markets Editor

• • •

the freight with no absorption) instead of providing the industry with sharp competition would result in the uneconomical method of selling products in the backyard of the producing steel plant.

Among some of the things contained in the exhaustive opinion delivered by Circuit Judge J. Earle Major which steel officials regard as highly significant include the following: (U. S. Circuit Court of Appeals for the Seventh Circuit, October Term, 1945, April Session, 1946, decision rendered Sept. 20, 1946, known popularly as the cement case, 8360, et al.)

" . . . The basing point price system has been in use by industry for almost a half century.

"In our judgment, the question as to whether the basing point price system should be declared illegal rests clearly within the legislative domain. We know of no criticism so often and so

forcibly directed at courts, particularly Federal courts, as their propensity for usurping the functions of Congress. If this pricing system which Congress has over the years steadfastly refused to declare illegal, although vigorously urged to do so, is now to be outlawed by the courts, it will mark the high tide in judicial usurpation.

"As we have already known, the Commission's order proposes to make Supreme the advantage of a mill selling in the territory where it has a freight advantage, and to make its disadvantage so great when selling in a competitor's territory as to practically preclude it from entering that market. In fact, the advantage and disadvantage would no longer be natural but artificial, effected by the requirement that each mill sell on an f.o.b. mill price. The change from the present system to one conforming with the Commission's order would be like jumping from the frying pan into the fire.

"The fact is that the restraint which the Commission professes to discern, effected by freight absorption, is insignificant as compared with that which would result if each sold only in its own backyard, as the Commission would have them do.

"Under the circumstances shown, we think it is the inevitable result of any pricing system that cement must be sold at the same place at a uniform price whether it be at the point of production or that of destination. Suppose the Commission's order becomes effective, can it be doubted that the plant price of cement of producers located in the same area will be uniform? If one producer persists in selling for more than the others, his customers will be lost. If he sells for less, the others will be compelled to lower their price to the same level, or forego the business. Further, if they sell at a uniform price it will immediately create, according to the Commission's theory, an inference that they are acting in collusion."

### Basing Point Reports

#### New York

• • • In the fall of 1945 considerable interest was shown in the steel basing point system as the result of the so-called Corn Products Case in which the Supreme Court in effect ruled out the single basing point system but made no distinct reference to the legality of the multiple basing point system.

In the May 3, 1945, issue of THE IRON AGE, p. 74, is a discussion of the Corn Products Case which is credited with causing changes in the steel price system. The stainless steel basing point change was covered in the Sept. 13, 1945, issue, p. 99.

Other references pertaining to the steel industry may be found in the issue of Sept. 20, 1945, p. 109, and Sept. 27, 1945, p. 95.

An "ABC of Basing Point System" pertaining to steel appeared in THE IRON AGE, Oct. 4, 1945, p. 121, and the Washington angle on the basing point problem was reported on p. 94 of the same issue.

## U.S. Steel and USWA Agree on Basic Policy On Plant Standard Rates

Pittsburgh

• • • Conclusion of agreements between the five steel-producing subsidiaries of U. S. Steel Corp. and the United Steelworkers of America on principles and procedures to be followed in the establishment of plant standard hourly wage scales and in the elimination of any intra-plant wage rate inequities found to exist was announced recently.

These agreements provide the guideposts for eventual coverage of all corporation steel producing plant jobs under standard wage scales, which will include in each plant only one standard wage rate for each of approximately 30 job classes.

A large part of the project, begun early in 1945 by U. S. Steel management and union representa-

tives, has already been accomplished. This involves a thorough description of 25,000 different steel mill jobs, and their classification, with the cooperation of the union, into 30 general categories. This description and classification work, on a plant by plant basis, is continuing.

Under the plan formulated by the current agreements, it is understood that any wage rate adjustments eventually made (and retroactive to January 1944, under the directive of the National War Labor Board) are to be solely for the purpose of eliminating intra-plant wage rate inequities, and cannot be general across-the-board wage increases. The third quarter of 1943 or the 12-week period closest to that time will be used as the base payroll period from which to determine the plant standard hourly wage scales.

A representative cross-section of jobs in U. S. Steel plants discloses that equitable plant standard hour-

ly wage scales will occasion for the subsidiary companies, as compared to the base payroll period, a total expenditure equal to an average of 3 7/8¢ per employee hour to provide any necessary upward adjustments.

Elimination of high out-of-line wage rates as the result of completion of the present management-union study will not apply to employees presently working at those rates until after Feb. 15, 1947. It is anticipated that normal turnover of employees and installation of new or revised incentive plans will be among the means utilized in the elimination of high out-of-line rates. All incentive plans will be reviewed and adjusted under principles of the agreement after the standard wage scales are established in the plants.

## Navy Reports Minute Loss in Granting War Loans to Contractors

Washington

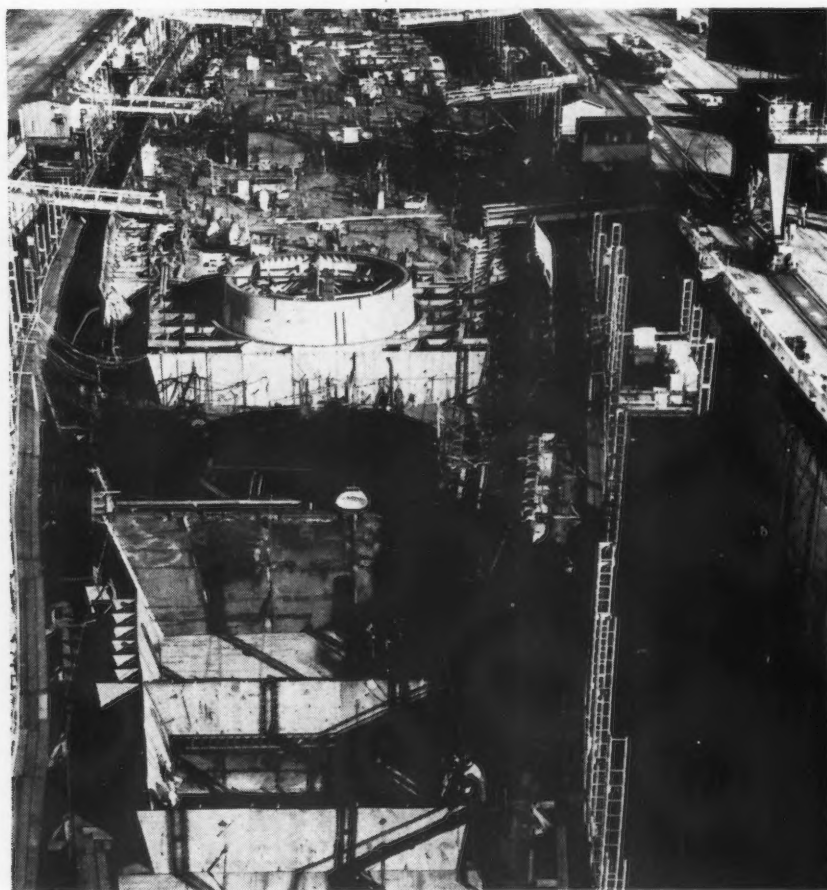
• • • An infinitesimal overall loss ratio of only 0.00043 is claimed by the Navy to have resulted in making advance payments and guaranteed loans totaling \$4,236,814,002 in its war production program of giving financial assistance to contractors who were unable to obtain private financing. The losses, it was stated, are more than offset by interest and underwriting fees received by the Navy.

A recent summary compiled by the Navy Dept. reveals that a total of \$2,021,814,002 in advance payments and \$2,215,000,000 in guaranteed loans were made to contractors under circumstances where the credit risk often would not be accepted by private sources.

Established losses on advance payments presently outstanding amount to \$594,506, and potential additional losses are estimated at \$250,750 for an overall loss ratio of 0.00041. Definite losses on guaranteed loans amount to \$826,732, and potential additional losses are estimated at approximately \$149,000 for an overall loan loss of 0.00045.

Interest on advance payments totaling \$13,193,644 and cumulative underwriting fees on guaranteed loans amounting to \$7,389,000 have been collected under the program.

POST BIKINI BB: The Navy recently announced that the USS Kentucky (BB-66) would be redesigned to mount guided missile installations. Shown here under construction in a drydock at the Norfolk, Va., Navy Yard, the Kentucky is an Iowa-class battleship.





## Pittsburgh Steel Rate Holds Up Despite Power Strike; Finishing Hurt

### Pittsburgh

••• The Pittsburgh power strike entered its second week with steelmaking operations virtually unaffected, though metal fabricators were virtually shut down and steel finishing was somewhat curtailed. The strike appeared to be setting a pattern which some experts believe will spread throughout the country. The inability of government to deal with the situation after a full week despite an injunction against both the union and the company, shows utility company unions throughout the nation the bright and easy road to higher wages and stronger union demands.

When the injunction against strikes was made illegal in Pennsylvania some years ago, it was done to eliminate a tool that industry had used widely—often misused—to break up strikes. Its use by a municipality to protect the citizens under its jurisdiction was never considered at the time it was abolished. Now the city of Pittsburgh has no legal weapon to stop the strike and the city government has been placed in a very vulnerable position.

The strike of power plant employees rapidly spread to employees in other subsidiary companies. Street car and bus service had completely stopped by the fourth day of the strike, and overtures by the union were made to determine whether other services could be stopped. George L. Mueller, president of the union, hailed the day the strike started for contempt of court in disobeying the injunction, was released within 48 hr.

His release was hailed by his union, raising his prestige. Success was his and over the past weekend, he showed his power when he responded to the question as to whether or not the mayor of the city had been advised of the results of a union meeting, by stating that the affairs of his union were none of the mayor's business.

Outside interest in the strike has been keen. Last Monday, it was announced that William Mar- golis, Assistant Regional Direc-

tor of the U. S. Conciliation Service, and Lucien Rye, crack mediator in power and electrical disputes, would immediately go to work to bring about some kind of a settlement. Appeals to the various unions affiliated with CIO and AFL to bring pressure to bear on this independent power union were made by the mayor.

## ASME Announces New Election of Officers

### New York

••• The election of Eugene W. O'Brien, publisher, of Atlanta, Ga., to head The American Society of Mechanical Engineers for the coming year was announced recently at national headquarters of the society in New York. The new president succeeds D. Robert Yarnall of Philadelphia, and will take office following the annual meeting early in December. Five regional vice presidents and four directors at large also were named. Regional vice presidents to serve

He said that the union had broken its promises, but the company had come forth with offers that were "too little and too late."

Metalworking plants hit hardest were the fabricators, most of which have been shut down, and some finishing operations of the basic steel producers, such as at the Irvin works of Carnegie-Illinois. Basic steelmaking has not been curtailed to any significant degree because most operators are not dependent upon purchased power.

2 yr are: Professor Linn Helander, Manhattan, Kan., head of the department of mechanical engineering at Kansas State College; Thomas S. McEwan of Chicago, vice president of McClure, Hadden & Ortman, Inc.; Albert R. Mumford, development engineer, Combustion Engineering Co., New York; Edward E. Williams, Charlotte, N. C., general superintendent of steam plants for Duke Power Co.; and Alton C. Chick of Providence, R. I., assistant vice president of Manufacturers' Mutual Fire Insurance Co., reelected regional vice president of ASME to serve 1 yr.

### FARE PLEASE:

*This automatic ticket vending machine installed by the Pennsylvania RR in Philadelphia prints and issues suburban tickets and makes change in a matter of seconds. It does everything but announce trains and tell passengers where to get off.*



## Exporters See No Improvement In New Accelerated Licensing Plan

G. F. SULLIVAN  
Associate Editor

### New York

• • • The addition of a score of iron and steel items to the export license list plus a change to the so-called "accelerated" plan is not expected to simplify the export licensing system, according to reliable sources here. In fact they foresee the possibility of further difficulties in the near future, now that almost all iron and steel products are under export control.

Under the CL, or "accelerated" system which went into effect on Sept. 23, quarterly allocations will be made by the Office of International Trade of the Dept. of Commerce in the following manner: A specific tonnage will be set aside for veterans and new exporters and the remainder will be divided among established exporters. Individual allocations for the latter group will be made, it is stated, on individual historical records for a 2-yr base period. The base period to be used has not yet been determined; it may go back past 1939-1940.

From a study of the new regulations it appears that there will be no restriction as to amounts or destinations of exports to the "K" group of countries, which for the most part comprise former allies. Applicants are required to give the quantity to be shipped plus sufficient information to permit accurate identification, including Schedule "B" number, total selling price and the price per unit where possible.

Other features of the regulations require showing copper content of specified items. Individual licenses however will be required for the export of brass, bronze, copper and zinc materials to the Group "E" countries.

The overall purpose of the inclusion of practically all iron and steel products in the export licensing plan is to keep more material in this country. The CXS rating system is still in effect and the issuance of a license is no guarantee that mills will accept the orders.

It is not so much in the overall reduction of export business, but in the application of the licensing system that export men predict difficulties. Or rather, it is in the manner in which the reductions will be imposed that they foresee inequalities and confusion to come. In the first place, they maintain that OIT lacks sufficient data on which to base its quotas. They charge that there are no means in the new setup to check on the validity of a license application and they assert that OIT lacks the experienced men to do the job properly.

Historical data on individual exporters' past sales are not currently available in Washington in usable form. Since the start of the war there has been a tremendous influx into the ranks of iron and steel exporters; some of these new firms are legitimate, others are black market operators. It is known, for example, that substantial quantities of nails and wire are being exported at high black market prices. Recently some 5000 tons of black sheets were bought for export at 7½¢ per lb, more than twice the domestic ceiling price.

OIT is now being deluged by a flood of applications, some from

### SUMMARY OF UNITED KINGDOM STEEL STATISTICS

Source: British Iron & Steel Federation

All Figures Thousands of Net Tons	STEEL			PIG IRON	SCRAP	IRON ORE	
	Ingot and Castings	Finished Deliveries	Steel Stock (1)	Production (2)	Steelmaking Consumption	Imported Ore Consumption	Home Production
1944 Total .....	13599.0	11502.4	2431.5	7542.0	8252.6	2725.6	17332.2
1945 Total .....	13237.8	9992.3	1885.9	7959.4	8065.9	4494.7	15870.4
1945 July .....	956.9	695.3	1475.4	603.9	597.1	347.2	1228.8
August .....	1041.0	796.8	1434.4	701.1	619.3	436.2	1239.2
September .....	1077.8	792.5	1415.4	624.9	650.0	438.1	1102.5
October .....	1360.8	932.4	1356.8	818.1	818.1	595.2	1385.4
November .....	1106.1	803.7	1358.0	672.0	659.9	467.7	1115.5
December .....	992.3	735.6	1332.4	651.8	592.7	449.7	1036.6
1946 January .....	1025.0	971.0	1370.9	803.6	754.8	541.5	1373.6
February .....	1107.5	833.2	1341.5	654.5	657.2	445.8	1147.3
March .....	1145.5	898.6	1314.7	659.9	695.2	484.2	1148.6
April .....	1129.4	827.0	1265.1	666.1	682.7	499.0	1090.8
May .....	1466.0	1139.0	1283.6	846.7	890.9	644.5	1371.4
June .....	1074.3	859.2	1266.3*	678.7	640.1*	531.7	1010.2
July .....	1012.9	791.1	1299.8	656.5	618.2	534.9	986.9

\* Held by producers and in British Iron & Steel Corp. stockyards at the beginning of the years and months shown.

\* All qualities, including ferroalloys.

\* Revised.



exporters of the above stamp, others from firms who do legitimate business at ceiling prices. Such conditions are expected to make it difficult, if not impossible, for OIT to set up an equitable quota system on which to approve export licenses.

To this must be added the problem posed by the lack of a check on the actual orders back of a license application. OIT must assume that orders exist for which licenses are sought. In some cases these orders not only exist but the exporter is reasonably certain of delivery in the quarter applied for. Since the number of export firms in this fortunate position is limited it is reported that OIT often assumes delivery will be delayed until the following quarter. Quite often the agency is right, if they should be wrong the legitimate exporter suffers.

At the current rate total applications appear well on the way to exceeding the total allowable exports. This means that some applications must be cut. Certain New York export circles are therefore of the opinion that firms with legitimate orders will find themselves competing for quotas with export houses that have submitted applications for far more tonnage than they actually have on order. The result will be to penalize legitimate exporters at the expense of unscrupulous operators.

Finally, while OIT expects the new setup to cut the daily total of applications processed by its Metals & Minerals Div. from 1200 to about 300 under the new CL plan, it is clear that there will actually be a larger tonnage of iron and steel to be reviewed because of the additional items recently added to the list.

OIT's Minerals & Metals Div. has a staff of 28, including a Steel Section with a staff of five. According to reliable Washington sources, none of the key officials of the division, including the Steel Section, have held responsible positions either in private iron and steel export firms or in the export branches of steel companies. This is causing bitterness in export circles, which assert that government officials charged by law with interference with the laws of supply and demand should have a sound background of private business experience in the operation of those laws.

There are now approximately 100 items of building materials and equipment required for the Veterans Emergency Housing Program under export control. These controls were applied by the Office of International Trade of the Dept. of Commerce on recommendations of NHA and CPA.

Iron and steel products added to the list requiring licenses as of Sept. 11 are: Steel sheet bars and tin-plate bars containing no alloy; concrete reinforcement bars; other steel bars (hot rolled) containing

no alloy, 1 in. and under only; wire rods; skelp iron and steel; plain black sheets; black iron sheets; cold-rolled iron and steel strip; structural shapes; malleable iron screwed pipe fittings; cast-iron screwed pipe fittings; cast-iron pressure pipe; cast-iron pressure pipe fittings; welded black steel pipe; wrought iron welded galvanized pipe; iron and steel pipe fittings; bale ties, bale wire; wrought iron welded black pipe; and welded galvanized steel pipe.

### Trade Agreement With Paraguay Sharply Drops Duties on Metal Items

#### Washington

• • • Substantial reductions in Paraguayan import duties on American-made metal products have been obtained through completion of the reciprocal trade agreement between the United States and Paraguay which was signed Sept. 12.

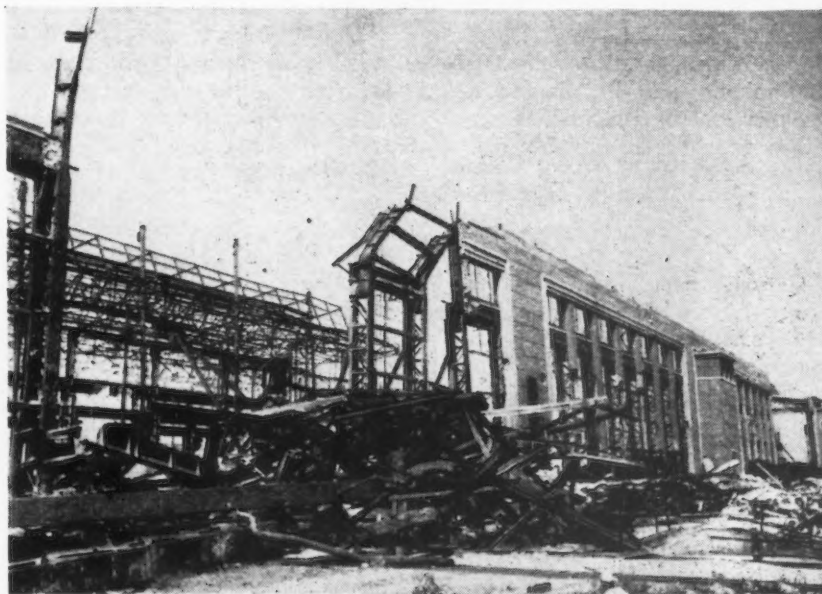
Included among the products affected were passenger cars and trucks, automotive parts, refrigeration and electrical equipment, including storage batteries, office machines, and assorted hardware items such as axes, hatchets, small

tools, horseshoes and horseshoe nails.

The United States supplies the bulk of automotive products, radio and refrigeration equipment imported by Paraguay; on the other hand, this nation has previously exported to that nation only small quantities of hardware and office machines.

Since 1937, U. S. exports to Paraguay have risen from \$700,000 in that year to \$2,600,000 in 1945; at the same time, imports of Paraguayan products into this country have grown from \$1 million in 1937 to \$6.8 million in 1945. Imports from the South American country have been largely in the form of raw materials which are admitted free of tariff or at low rates of duty.

**STILL A MESS:** According to Russian sources this photo was made this summer at the Zaporozhye Iron & Steel Works in the Ukraine. It shows the plant's sheet rolling mill as it was left by the Nazis.



## Government Bureaus to Begin New Movements to Bring in More Scrap

### Washington

• • • Three additional moves to stimulate iron and steel scrap collection were made recently by government bureaus. From WAA came an expansion of the machine tool salvage program which looks to wholesale scrapping of all types of specialized tools which are declared to be commercially unsalable. From the Dept. of Agriculture came announcement of a countrywide campaign to have farmers gather up all the scrap they can comb from their lands.

The Department took this action at the request of Civilian Production Administrator John D. Small. At the same time, farm implement dealers were urged to join forces in gathering old material for scrap-hungry steel mills. Appeals to dealers were made by the Farm Equipment Institute which represents more than 200 farm implement manufacturers and by the National Farm Equipment Dealers' Assn., representing 16,000 dealers.

The WAA sent its regional offices a list of machines which supplements its special and single Purpose Machines Classification to be used as "Master Lists." This classification was first issued on Sept. 1. The additional machines will be placed in the same classification as soon as clearance is obtained from the armed forces.

Instructions were issued to regional offices to follow a fixed procedure when submitting machines for inclusion in the master list, and provide for close checking of a finding that the machines are not salable commercially.

In detail the regional offices are required to submit a statement that:

(1) The machine or machines have been offered for sale and/or advertised and no interest has been evidenced indicating that they are commercially salable.

(2) A recognized consultant from industry has stated that the machine has no commercial salability and conversion to such salability would be of prohibitive cost.

(3) A recognized machine tool manufacturer concurs with the consultant's statement in part (2).

(4) A recognized machine tool dealer and/or manufacturer's agent concurs with the consultant's statement in part (2).

(5) Submit a glossy print of the machine about 8½ in. by 11 in., the SPB-1 (Surplus Property Board) or declaration, and any information available as to the part it was used to manufacture and the Armed Service Branch for which part was made.

(6) A concluding statement by the Chief of Scrap Coordinating Panel, that in his opinion the best interest of the government will be served, due to cost of care and handling, by having the machine or machines placed on the "Master List."

When the above complete file has been received in Washington

on a machine tool, the Armed Services will screen the tool, for "Strategic Reserve" requirements, and if it is not needed the machine tool will be put on the master list and the regions directed to proceed with the scrap and salvage procedure. If steps 2, 3, or 4 cannot be accomplished in your region, so state and forward file. Washington will accomplish the determination in that case.

In connection with the drive to gather farm scrap, CPA and the Dept. of Agriculture pointed out that there are no organized facilities for this particular operation.

CPA also expects to stimulate the flow of industrial scrap by the reinstitution of the salvage committees which performed such outstanding service on salvage drives during the war. These committees, which work closely with industry, have been voluntarily revived and blanket the nation. Most state and city officials, in response to CPA request, have told their administrations to search for and dispose of all available scrap.

## Chances for Modifying Some CPA Allocation Orders Now Possible

### Washington

• • • Modification of several CPA allocation orders is a distinct possibility as a result of Federal District Court decision enjoining the Secretary of Agriculture from allocating grain to distillers on a historical basis.

The decision was handed down by District Court Justice Henry A. Schweinhaut in the suit of *Publiker Industries v. the Secretary of Agriculture*. The Dept. of Justice maintains that the temporary injunctions will have a "serious impact" on all allocation operations, even though it directly affects only the allocation of grain for beverage alcohol.

CPA orders affected include: M-38 (lead); M-43 (tin); M-81 (cans); and L-354 (lead chemicals). CPA's limited allocation plan for scrap might also be affected. Further study will be necessary before any decision is reached on the impact of the court's action on orders using an historical basis.

Justice Schweinhaut in his memorandum stated that in his view the Secretary of Agriculture disobeyed the Congressional mandate contained in the War Mobilization and Reconversion Act, which reads in part:

"Production for nonwar use shall not be made dependent upon the existence of a concern or the functioning of a concern in a given field of activity at a given time."

## Workers Vote to Return

### Springfield, Ill.

• • • The Allis-Chalmers Mfg. Co. employees here voted overwhelmingly on Sept. 18 to return to work. Terms of the contract include a wage increase of 13½¢ an hr to bring the total increase since V-J Day to 18½¢, the company plan for government supervised strike votes, and irrevocable voluntary checkoff of union dues and assessments. Production at the Springfield plant was resumed Sept. 23. Principal product of this Allis-Chalmers unit is the industrial crawler type tractor and the plant employs 2200 workers.



# Weekly Gallup Polls . . .

## Ex GI's Have No Gripe About Government Treatment

Princeton, N. J.

• • • Are ex-servicemen satisfied with the way the government has treated veterans?

The majority of them are, according to a special poll of veterans just conducted by the American Institute of Public Opinion, George Gallup, director. Seven in every ten polled say they have no special complaint to make—a vote which will undoubtedly come as good news to Gen. Omar N. Bradley, head of the Veterans' Administration.

Those dissatisfied have three suggestions. They think the government should get on faster with the business of housing for ex-servicemen. They also want Washington to untangle red tape surrounding GI loans. And some feel that the government should consider giving veterans an outright bonus.

In August President Truman signed a bill increasing by 20 pct the pensions of nearly 2,000,000 veterans of World Wars I and II, and providing other benefits for ex-servicemen.

To find out what the World War II veterans think of the government's general program for veterans, the institute put this question to a cross-section of them.

"Has the government given you, as a veteran, all the help you think it should?"

The vote:	Pct
Yes .....	71
No .....	26
No opinion .....	3

Those who said no were asked: "What more should it do?"

The principal replies were: pay a bonus, get more living quarters for veterans, and cut out red tape in obtaining GI loans.

The poll also probed the attitudes of ex-servicemen toward their life in the armed forces as they look back on it.

The most disliked aspects of the service, the poll found, were the regimentation, the caste system, and the officers.

However, the majority of veterans say that they benefited from their experience in the service, in

spite of its irritations and hardships.

• • • The downward trend of Democratic party popular strength which began a year ago has halted, and a slight upward turn in the party's popularity is noted in a survey by the institute.

The party strength figures, in terms of the vote for president if a presidential election were being held today, show that 50 pct say they would prefer the Democrats, and 50 pct the Republican Party. The last poll, in July, found the Democrats at 49 pct, the Republicans at 51 pct.

This poll with its 50-50 division between the major parties indicates a four point loss for the Democrats since the 1944 presidential election, and an eight point drop since the end of the war. In August, 1945, Democratic party strength stood at 58 pct in a similar poll.

Unless the Democrats stimulate unusual public interest in the coming Congressional elections and produce a phenomenally large turnout on election day, they face a tough fight holding control of the House of Representatives.

Past experience shows that when turnout of voters is low in a national election the Democratic party suffers because a higher proportion of the stay-at-homes are Democrats.

The trend of party sentiment in terms of a presidential election is shown in the following table, which gives the major party vote in the last four presidential elections and the trend since 1944 in terms of poll findings. The poll results are based on the question, "If a presidential election were being held today, which party would you vote for, the Democratic or Republican?"

	Dem. Pct	Rep. Pct
1932 Election .....	59	41
1936 Election .....	62½	37½
1940 Election .....	55	45
1944 Election .....	54	46
Aug. 1945 .....	58	42
Feb. 1946 .....	55	45
May 1946 .....	52½	47½
July 1946 .....	49	51
TODAY .....	50	50

## Over 70 Pct of Veterans Feel They Have Been Well Treated; Chief Complaint Is Housing

• • •

Democrats will undoubtedly find comfort in the fact that adverse trend noted since August has not continued. It seems safe to conclude that, at the present time, the country is not witnessing a political groundswell in favor of either party. The two parties remain closely matched.

Today's poll does not reflect public reaction to the controversy over Henry A. Wallace's recent speech on foreign affairs. The interviewing for the poll had been completed before Mr. Wallace spoke.

Democratic strength, the poll indicates, is still concentrated in the manual worker population.

Republican strength is greatly among professional and business people and among farmers particularly those outside the South.

The two parties are about equally strong among white collar workers, with Republicans holding slight advantage in this group.

The division by occupation groups follows, for today and for the last presidential election, in terms of Democratic party vote.

Percent Democratic of Major Party Vote

	Today Pct	1944 Election Pct
Prof. & Bus. ....	39	41
Farmers .....	44	48
White Collar .....	47	51
Manual Workers .....	60	62

Labor union members polled in the survey vote 65 pct Democratic, as against 62 pct in the July poll, and 72 pct in the 1944 presidential election.

• • • In the opinion of rank and file members of the AFL the trouble with the CIO is that "it is

(CONTINUED ON PAGE 137)

## Shortages Eliminate \$161 Million from Detroit Projects

### Detroit

• • • The extreme tightness of new construction materials has cut more than \$161 million from Detroit industrial expansion programs in less than 6 months.

Since Mar. 26, 1946, Federal order VHP-1 limiting new building construction has resulted in the denial of more than 2000 applications to build nonhousing structures in Detroit having a gross value of \$61.9 million according to John D. McGillis, Michigan District Manager of CPA. In addition nearly \$100 million has been deferred voluntarily or at the request of the CPA office.

At the time the restriction order became effective a large number of Detroit firms were about to begin new plant construction and had already ordered necessary materials. In many cases, structural steel was completely or partly fabricated and millions of dollars of equipment was then en route and would have required storing if the application was denied. This situation resulted in the approval of many sizable projects in the early days of CPA and constitutes a substantial per-

By WALTER G. PATTON  
Detroit Regional Editor

• • •

centage of the \$51 million construction total which has been authorized by CPA since Mar. 26 on 1266 applications.

The complete record showing the number and value of projects approved and denied by CPA in the Detroit area from Mar. 26 to Aug. 22, 1946 is shown in the table below. It will be noted that in the beginning a comparatively large number of projects were confirmed. Later when the veterans housing program was given more right-of-way the value of nonhousing programs declined sharply.

Contrary to an opinion widely held by the public the denial of construction permits by CPA is not an arbitrary or bureaucratic procedure. An advisory board composed of prominent Detroit citizens meets every week with the CPA district manager, and advises him

as to which projects should be accepted and which ones denied.

The board in Detroit consists of the following members: W. H. Hall, Detroit Board of Commerce; R. J. Hodgson, vice president, National Bank, Detroit; L. A. Lesinski, Hamtramck Lumber Co.; R. A. McMullen, secretary, General Contractor's Assn.; A. Scholle, State President, CIO; R. W. Symes, retired; E. E. Thal, AFL Business Manager, Building Trades Div.; D. C. Weeks, Director State Planning Commission, Lansing.

While this board acts primarily in an advisory capacity, its advice carries considerable weight and has been since the organization of CPA in Detroit a controlling factor in CPA operations.

Seven tests have been established as a basis on which applications for nonhousing construction are either approved or denied.

- (1) Is the project vitally necessary to public health and safety?
- (2) Will it increase production of critical products?
- (3) Is it essential to increase food production or food preservation?
- (4) Will the new construction provide minimum community facilities absolutely necessary for residential areas developed as part of the veterans housing program?
- (5) Will the construction provide urgently needed veterans' educational facilities?
- (6) Does the building project constitute essential and non-deferrable maintenance and repairs?
- (7) Will the project have any impact whatsoever on the housing program?

One basis for making decisions on nonhousing construction is illustrated in the following case example. For instance, an application to construct a large swimming pool and bath house facilities in Detroit's east side was recently denied by CPA on the grounds that there would be too much interference with the veterans housing program. The application called for the installation of 85 toilets, urinals, lavatories, etc., in addition to

Applications Processed in Detroit CPA District Office

Period	Approvals				Denials				Total Both	
	No.	Pct of Total	Value	Pct of Total	No.	Pct of Total	Value	Pct of Total	No.	Value
Mar. 26—May 30 (8 weeks)	616	39	\$31,629,497	55	969	61	\$25,567,816	45	1585	\$57,197,313
May 31—Aug. 22 (12 weeks)	650	37	\$19,278,401	35	1123	63	\$35,326,454	65	1773	\$55,604,855
Total.....	1266	38	\$50,907,898	45	2092	62	\$61,894,270	55	3358	\$112,802,168

### Analysis of Approvals

May 31 to Aug. 22, 1946

	Number	Pct of Total	Value	Pct of Total
Extreme Hardship.....	220	34	\$ 5,391,099	28
Public Health and Safety.....	109	17	\$ 4,090,302	21
Production Critical Products.....	10	2	\$ 346,372	2
Food Production and Preservation.....	54	8	\$ 926,576	5
Community Facilities—Vet. Housing.....	6	1	\$ 718,900	4
Veterans Educational Facilities.....	14	2	\$ 1,711,957	9
Maintenance and Repair.....	73	11	\$ 787,888	4
No Impact on housing.....	154	24	\$ 8,303,315	27
	650	100	\$19,278,401	100

(Approvals have been at the rate of \$1,610,000 per week for past 12 weeks.)



enough feet of soil pipe to connect 100 veterans' homes to the street sewer. This project was denied on the grounds that it was not vitally necessary to public health and would have had a considerable impact on the veterans housing program.

On the other hand, a project calling for an expenditure of \$720,000 for Wayne University was approved on the grounds that educational facilities are absolutely essential in furthering the veterans program.

Another function performed by CPA is to divert materials from extremely tight items to substitute materials which can be made to serve in the present emergency. For example, many builders have been induced to use tile rather than cast iron soil pipe, one of the most critical items in the entire builder's list. The CPA office estimates that it has been able to save many thousands of feet of soil pipe by recommending such changes to prospective builders.

In a few cases, Detroit industrial firms have received CPA approval to construct foundations and erect steel for new building projects with the understanding that construction will halt when this point is reached. At the present time, cement, while scarce, is not a critical item in the Detroit area and the steel members will not in any case be delivered for 4 to 5 months. Thus, a builder who is convinced of the ultimate need for a certain structure can gain as much as 6 months' time in agreeing to start construction now with the understanding that the project will not be fully completed until scarce building materials again become available. This policy has the further advantage of keeping structural iron workers working who would otherwise be idle.

A recent survey completed by Detroit officials working with the builder's association of metropolitan Detroit shows that each of the following items is critical enough to hold up thousands of dollars of construction work. The list includes flooring, doors, plumbing equipment and fixtures, electric light switches, electric plugs, wiring, soil pipe, gypsum lath and nails.

In order to keep a constant check on the progress of housing construction in Detroit, a new rule has been adopted by the Dept. of Build-

ings and Safety Engineering which requires contractors and builders to make reports on the progress of their construction work at stated intervals. It is expected that as a result of the filing of this information Detroit will now be able to keep a constant check on the progress of its housing program.

At one time General Motors alone had planned to spend \$600 million for industrial expansion; Ford has outlined plans for \$225 million expansion; Packard \$15 million; Hudson \$7 million; Nash-Kelvinator Corp. \$3 million. Other concerns in the automotive industry have announced proportionally large amounts.

At the present time, the General Motors expansion program has been severely curtailed. Construction work on the \$75 million light car building program in the Cleveland area has been halted. Work on the General Motors research project which was expected to cost \$20 million is being held in abeyance. The huge Ford research project has not yet been started.

Meanwhile, the fact that the automobile industry is only operating today at about 50 pct of capacity would indicate that many of these expansion projects can safely wait until such time as the critical veterans housing problem is much closer to a solution than it is today.

As satisfactory progress is reported and as building materials now in tight supply become more plentiful, it is expected that present restrictions on nonhousing projects will be lifted and many plans for expansion previously announced but now being held up will be started. There are some indications that this may occur before the summer of 1947.

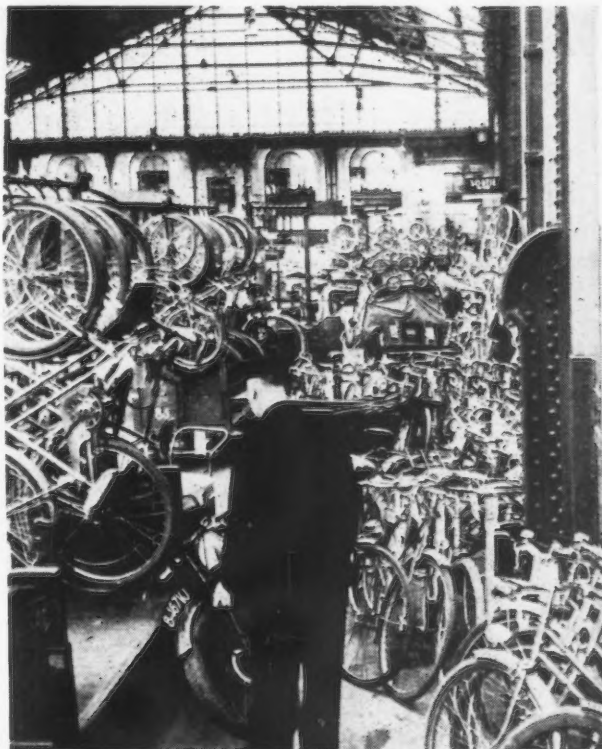
## To Serve on Committee

Cleveland

••• H. L. Edinger, president Gray Iron Founders' Society, has appointed the following to serve as the Society's Technical Committee: George Johnstone (chairman), president and general manager, Lawrence Foundry Co., Grove City, Pa.; R. A. Flinn, American Brake Shoe Co., Mahwah, N. J.; Harry W. Dietert, Harry W. Dietert Co., Detroit; J. D. Judge, Hamilton Foundry & Machine Co., Hamilton, Ohio and J. S. Vanick, International Nickel Co., New York.

Regional meetings have been held in Cleveland, Cincinnati, St. Louis, Milwaukee, New York, Boston, Wallingford, Conn., Buffalo and will be held Sept. 26 in Reading, Pa., and Sept. 30 in Pittsburgh.

PARKING PROBLEM: Parisian cyclists leave their wheels at a railroad station for shipment as baggage. Automobiles are scarce in France and many vacation trips are by combination of steam and foot power.



## Canadian Sales of Pig Iron Ingots, Castings For 1944 Drop 5 Pct

Ottawa

• • • Canadian factory sales of pig iron, ferroalloys, steel ingots and castings, and finished rolled products for the year 1944 were 5.1 pct lower than they were in

1943, according to the Dominion Bureau of Statistics, which reported values at \$221,509,681 and \$223,951,059 respectively.

Pig iron output of 1,852,628 net tons in 1944 was 5 pct over the 1,758,269 tons reported for the previous year. Production of basic iron amounted to 1,534,140 tons of 83 pct of the total; four-

dry iron amounted to 143,763 tons and malleable iron to 174,725 tons. Producers' sales of pig iron totaled 400,010 tons at \$8,641,495 in 1944 compared with 387,109 tons at \$8,328,322 in 1943. Charges to iron blast furnaces during the year included 3,227,039 tons of imported iron ore, 266,150 tons of Canadian ore; 1,687,967 tons of coke; 520,571 tons of imported limestone and 233,621 tons of Canadian limestone.

Imports of pig iron during the calendar year increased to 8516 tons from 7118 tons in 1943 and exports increased to 5698 tons from 438 tons. Producers' stocks at the end of 1944 totaled 49,615 tons compared with 28,230 tons at the end of the previous year. The apparent consumption of pig iron in Canada, as calculated by deducting the exports from the sum of the production and imports, and allowing for changes in producers' stocks, amounted to 1,834,061 tons in 1944 or 0.5 pct more than in 1943 when the apparent domestic supply was 1,824,674 tons. Producers of pig iron in Canada had 14 blast furnaces at the end of 1944 which could produce 2.7 million net tons a year if operated at rated capacity. Actual production of 1,852,628 net tons in 1944 showed an operating rate of about 69 pct. Ten furnaces were in blast during the year.

Ferroalloys were made in 1944 by 10 different concerns, five of which recovered ferrosilicon as a byproduct in the manufacture of abrasives. Output of ferroalloys in 1944 amounted to 171,323 net tons, a decrease of 13 pct from the 197,094 tons reported for 1943. Altogether ferrosilicon was made in nine different plants, spiegel-eisen in two and ferrochrome in two. Other alloys produced by one firm only included ferromanganese, silicospiegel, silicomanganese, silicon metal, calcium silicon metal, calcium silicon, calcium manganese silicon and ferrophosphorus.

Steel ingots and castings production increased 0.6 pct to 3,024,236 tons in 1944 from 3,005,653 tons in 1943, the output of steel ingots going to 2,873,868 tons from 2,846,736 tons and steel castings to 142,294 tons from 157,388 tons. Factory sales of ingots and castings totaled 178,680 tons at \$35,955,323. Thirty-seven steel plants were in operation during

## Canadian Steel Production and Shipments

Toronto

• • • Canadian steel mills in June produced 204,986 tons of carbon and 9350 tons of alloy steel ingots and castings compared with 245,894 tons of carbon and 13,766 tons of alloy steel ingots and castings in May. During June shipments of primary shapes totalled 220,715 net tons compared with 270,061 tons in May. Shipments for June included 33,514 tons of semi-finished shapes; 13,582 tons of structural; 19,402 tons of plates; 12,364 tons of rails; 6875 tons of track materials; 45,109 tons of bars; 8564 tons of pipe and tubes; 21,783 tons of wire rods; 15,794 tons of black sheets; 6239 tons of galvanized sheets; 461 tons of tool steel; 5243 tons of castings; and 31,785 tons of other shapes.

During June Canada imported from the United States 588 tons of pig iron which compares with 1778 tons in May and 2475 tons in April. Other imports of steel in June included 3409 tons of hot rolled bars against 4568 tons in May; 4169 tons of structurals against 8070 tons in May; 6510 tons of plates compared with 3297 tons in May; 4084 tons of hot-rolled sheets and 3975 tons of cold-rolled sheets against 7164 tons of hot-rolled and 4921 tons of cold-rolled sheets in the preceding month. The following table shows Canadian production and shipments in net tons for the first 6 months of 1946:

Six Months Ended June 30, 1946	Carbon Steel		Alloy Steel	
	Made	Shipped	Made	Shipped
Billets, etc., for forging	30,826	31,286	1,684	2,020
Other semi-finished shapes, not for re-rolling	165,880	178,270	601	526
Structural shapes and piling	77,937	78,463		
Plates	110,945	107,953	6	
Rails	162,586	164,284		
Tie plates and track material	44,771	47,111		
Tool steel	1,337	1,245	1,254	1,200
Hot rolled bars for forging	33,034	29,664	12,428	12,739
Concrete reinforcing bars	25,796	24,894		
Hot rolled bars for cold finishing	5,405	5,585	6	6
Other hot rolled bars	190,327	187,529	13,863	13,140
Pipes and tubes	66,788	74,255		
Wire rods	134,838	138,786	103	83
Hot rolled black sheets	85,654	81,369		
Cold reduced black sheets	10,342	10,342		
Galvanized sheets	39,084	38,271		
Steel castings—by ingot makers	23,935	23,520	6,879	6,228
by other foundries	14,205	12,719	1,216	1,117
All other shapes, including tinplate, tin mill, black plate, cold finished bars and strips, etc.	189,204	187,898	772	769
<b>TOTAL ALL PRODUCTS</b>	<b>1,412,895</b>	<b>1,423,444</b>	<b>38,812</b>	<b>37,828</b>

Producers' shipments of primary iron and steel, including steel castings shipped by all foundries for the 6 months ended June 30, 1946, in net tons, subdivided according to principal consuming industries are as follows:

Industry	Carbon Steel	Alloy Steel
Automotive industries	27,927	19,846
Agricultural, including farm machinery	56,573	718
Building construction	95,530	326
Containers industry	92,191	55
Machinery and tools	49,003	3,376
Merchant trade products	137,936	261
Mining, lumbering, etc.	37,179	3,296
National defense	1,385	4
Pressing, forming and stamping	46,807	522
Public works and utilities	13,070	266
Railway operating	212,444	1,471
Railway cars and locomotives	84,692	1,476
Shipbuilding	28,978	154
Miscellaneous and unclassified	13,377	341
Wholesalers and warehouses	150,205	1,493
Producers interchange	273,627	903
Direct export—To British Empire	65,841	475
To other countries	36,699	2,845
<b>TOTAL SHIPMENTS</b>	<b>1,423,444</b>	<b>37,828</b>



the year. At the end of 1944 these plants had 138 furnaces, including 51 basic openhearth with an annual capacity of 2,841,400 net tons, 84 electric furnaces rated at 830,800 tons, and three converters at 8000 tons.

There were just 12 makers of steel ingots with capacity of 3,324,900 net tons per year. The total annual steel capacity of all plants, including ingots and castings, was 3,680,200 tons at the year end. Operating steel furnaces in 1944 used 1,513,586 net tons of pig iron, 1,642,250 tons of scrap iron or steel, 155,768 tons of ores, 237,167 tons of limestone, 85,601 tons of dolomite, 63,721 tons of lime, 89,807 tons of silica sand, 18,665 tons of magnesite and 38,823 tons of ferroalloys.

### Army Puts Research, Development on Top General Staff Level

New York

...Faced with the fact that scientific developments are revolutionizing the weapons of war, the War Dept. has created a new research and development division at the top General Staff level. It will be headed by Maj. Gen. Henry S. Aurand, who will be supported by top-flight civilian engineers and scientists.



Maj. Gen.  
H. S. Aurand

The application of scientific knowledge has been accelerated to such a degree that the entire problem of national security must be brought constantly under review. Many World II weapons are already obsolete and present War Dept. research and engineering programs in the field of atomic energy, and in such other fields as guided missiles, radar, biological warfare, and air power, are certain to revolutionize the strategy and tactics of warfare in the immediate future.

There is further recognition of the fact that, in the field of logistics, our nation, in the atomic age, will not be allowed much time for

In 1944 there were 19 mills occupied chiefly in hot rolling of steel products and 3 mills making only cold-drawn and cold-rolled shapes. Ten of these mills were in Ontario, 3 in Nova Scotia, 4 in Quebec, 1 in Manitoba and 1 in Alberta. Rolling mill sales declined 9 pct to \$143,768.146 from \$158,138,483 in 1943.

The main items sold during the year under review were: 428,982 tons of hot-rolled bars at \$30,099,216; 389,671 tons of plates at \$26,566,575; 201,098 tons of sheets, hoops, bands and strips at \$16,910,375; 376,727 tons of rails and rail fastenings at \$19,042,506; 336,959 tons of semifinished rolled forms, such as blooms, billets, etc., at \$17,041,753; 159,241 tons of structural shapes at \$9,380,379; and 105,046 tons of wire rods at \$4,300,337.

industrial and scientific mobilization. Should we be attacked by atomic weapons of great range and striking power, we must be prepared to strike back instantly in our own defense or we shall most certainly go under.

These considerations led Gen. Dwight D. Eisenhower, on April 30, 1946, to announce a new War Dept. research and development policy.

"The future security of the nation," General Eisenhower declared, "demands that all those civilian resources which by conversion or redirection constitute our main support in time of emergency be associated closely with the activities of the Army in time of peace."

"The lessons of the last war are clear. The military effort required for victory threw upon the Army an unprecedented range of responsibilities, many of which were effectively discharged only through the invaluable assistance supplied by our cumulative resources in the natural and social sciences and the talents and experience furnished by management and labor. The armed forces could not have won the war alone. Scientists and business men contributed techniques and weapons which enabled us to outwit and overwhelm the enemy. Their understanding of the Army's needs made possible the highest degree of cooperation. This pattern of integration must be translated into a peacetime counterpart which

will not merely familiarize the Army with the progress made in science and industry, but draw into our planning for national security all the civilian resources which can contribute to the defense of the country."

General Eisenhower listed five policies to be put into effect to achieve these ends:

1. The Army must have civilian assistance in military planning as well as for the production of weapons.

2. Scientists and industrialists must be given the greatest possible freedom to carry out their research.

3. The possibility of utilizing some of our industrial and technological resources as organic parts of our military structure in time of emergency should be carefully examined.

4. Within the Army we must separate responsibility for research and development from the functions of procurement, purchase, storage and distribution.

5. Officers of all arms and services must become fully aware of the advantages which the Army can derive from the close integration of civilian talent with military plans and developments.

In the interest of cultivating to the utmost the integration of civilian and military resources and of securing the most effective unified direction of Army research and development activities, this responsibility was consolidated in a separate section on the highest War Dept. level. The new director of the recently created Research and Development Div. of the War Dept. General Staff, Maj. Gen. Harry S. Aurand, is directly supported by civilians, thus ensuring full confidence of both the military and civilians alike in this important undertaking. By the rotation of civilian specialists in this capacity the War Dept. has the benefit of broad guidance and is able to furnish science and industry with a first-hand understanding of Army problems and objectives. Once again the Army is demonstrating the value it places upon science and technology and is constantly striving to further the integration of civilian and military resources for preparedness and peace.

General Aurand was born in Tamaqua, Pa., on April 25, 1894, and graduated from West Point in 1915. He is also a graduate of the

Command and General Staff School, the Army War College, and the Army Industrial College. He holds 12 decorations for outstanding military service. During World War II he was Director of the International Div., Headquarters, Army Service Forces; Commanding General of the Sixth Service Command, with headquarters in Chicago; Deputy Chief of Ordnance, Communications Zone, European Theater of Operations; Commanding General, Normandy Base Section; Commanding General, Army Service Forces in the China Theater; and Commanding General, Africa-Middle-East Theater. In June 1946 he was appointed Director of the new Research and Development Div., War Dept. General Staff, Washington 25.

As Director of Research and Development, War Dept. General Staff, General Aurand has primary War Dept. interest in the application of national scientific resources to the solution of military problems. He is the adviser to the Secretary of War and the Chief of Staff on all War Dept. matters relating to research and development. He has over-all War Dept. responsibility for the initiation, allocation, coordination, and progress of research and development programs. He is also charged with bringing about the expeditious demonstration of new or improved weapons, military equipment, and techniques of their employment to the using services. He is responsible that adequate provision is made for the mobilization of the scientific effort

for carrying forward the research and development program of the War Dept.

At the moment, General Aurand is bringing into the Research and Development Div. of the War Dept. General Staff, on an annual rotation basis, a group of top-flight engineers and scientists recruited from the laboratories of our educational institutions, foundations and industries. They will assist him in the same manner as military personnel assigned to the division.

He is creating a War Dept. civilian panel of outstanding scientists and engineers, representing both the natural and the social sciences. The members of this panel, individually and in groups, will collaborate with him in the solution of special planning and technical problems which may arise from time to time.

General Aurand is fully alert to the fact that success in war will not be possible unless the Armed Forces have the best weapons that the scientific and industrial talent of the country can bring forward. He is firmly committed to the policy that future planning must involve the concept of a steady and enduring partnership of industry, science and military.

"In the United States of America the armed forces are what the people want them to be," General Aurand declared recently. "They belong to the people, and are as ready and strong as the support given to them by the people. In the fields of science, engineering and public relations, the same is true. No effort by the military will produce results without the support of the scientists, engineers and editors of the country. The support required is not solely a question of adequate appropriations. It is the question of enlistment of industrialists, scientists, and editors in the personal support of the research and development activities of the Army. Even if interest is lukewarm, the limitless task ahead becomes less because civilian leaders are thinking about it. If the Army's program is short of sufficient, or fails to reach its goal, it will probably be because the press and the people did not demand and support proper action. If it succeeds, the credit belongs to our great agencies of information and education, to enlightened public opinion."

### Coming Events

- Oct. 3-4 Magnesium Assn. of America, New York.
- Oct. 3-5 National Electronic Conference, Chicago.
- Oct. 3-5 Society of Automotive Engineers, aeronautic meeting and display, Los Angeles.
- Oct. 9-11 Porcelain Enamel Institute, University of Illinois.
- Oct. 10-12 American Society of Tool Engineers, semi-annual convention, Pittsburgh.
- Oct. 16-19 Electrochemical Society, fall congress, Toronto.
- Oct. 23-26 National Tool & Die Manufacturers Assn., convention, Chicago.
- Oct. 28 American Institute of Steel Construction, annual convention, Coronado, Calif.
- Oct. 28-30 American Gear Manufacturers Assn., semi-annual meeting, Chicago.
- Oct. 29-Nov. 1. Refrigerator Equipment Manufacturers Assn., exposition, Cleveland.
- Nov. 7-8 National Founders Assn., New York.
- Nov. 15-24 National Aircraft Show, first annual exposition, Cleveland.
- Nov. 17-22 American Welding Society, annual meeting, Atlantic City, N. J.
- Nov. 18-22 National Metal Congress and Exposition, Atlantic City, N. J.
- Dec. 2-4 Society of Automotive Engineers, air transport meeting, Chicago.
- Dec. 2-7 National Power Show, New York.
- Dec. 5-7 Electronic Microscope Society of America and American Society for X-ray and Electron Diffraction, joint meeting, Pittsburgh.
- Dec. 5-7 Electric Furnace Steel Committee of Iron and Steel Div., American Institute of Mining and Metallurgical Engineers, annual conference, Pittsburgh.



# The London **ECONOMIST**

## Another 1929?

THE last two weeks' sudden falls in Wall Street have deservedly attracted the attention of the whole world. Few people outside the borders of the United States are allowed nowadays to have a direct interest in the level of prices on the New York Stock Exchange; but everybody realizes that the Wall Street ticker is a very sensitive thermometer of the state of health of the world's decisive economy. In magnitude, the falls of the last few days have not been by any means unprecedented. But the reaction in the market has nevertheless been sharp and sustained. As usual, there has been a flood of fancy explanations. It has been said that the fall is due to fears of war, or to "bear raids" by anybody from the Republican Party to the Dutch Government. All this is very familiar. It appears to be a characteristic phenomenon of market collapses that the public will be invited to accept any explanation other than the obvious, but painful, one — that a number of well-placed observers think the prospects of American industry have taken a turn for the worse.

It is inevitable that the question should be asked whether this is the first beginning of another 1929 — not perhaps the final crash, but the first warning that came in the spring of that year, a full 9 months before the onset of industrial depression. The question cannot be shrugged off, for the Stock Exchange, in any country, whatever its other virtues and vices, has a good reputation as a prophet. It is, however, a one-way correlation: though there has never been a depression without a prior drop in the stock market, there has often been a sharp decline in the stock market without a following depression.

The necessity of judgment on the merits of the case cannot, therefore, be suspended. American commentators have been quick to point out the differences between 1946 and 1929. Stock exchange prices were not, before this year's break, pyramided up on a mountain of

borrowed money. The public is not, as a whole, heavily extended in indebtedness — on the contrary, it is phenomenally debt-free. These are real differences. But they run the risk of explaining away too much. After all, the market has fallen very sharply, and if it had not been inflated by ignorant buying on borrowed money, the phenomenon is all the more significant. A greater part of the collapse must be due to deliberate selling by people who know what they are doing.

THE big question about the American economy is, in essence, a very simple one. Will the volume of demand for the products of American industry keep up to the level that is necessary to maintain reasonably full employment? During the war years, the American community discovered that it could produce far more wealth than it had ever produced before. The gross national product of \$88 billion in 1939 had been raised by 1944 to about \$160 billion in dollars of the same purchasing power — to almost \$200 billion at current prices.

Even after the removal of the wartime pressures towards long hours and towards the recruitment into the labor force of women who do not normally work for a living — even now the American economy is capable of producing at least \$180 billion of goods and services a year. That means that it must sell \$180 billion of goods and services if it is to avoid unemployment. But its expenditures, on all objects other than fighting a war, have hitherto never been anything like as big. In 1939 they were \$87 billion, and by 1944, when the product had risen to \$199 billion, nonwar expenditures had risen only to \$112 billion. The question is whether the flow of peacetime demand can rise sufficiently quickly to take the place of war expenditures in sustaining the level of production.

The short-term answer is that it can, and has been done. If the second quarter of 1946 is compared with the second quarter of 1945 (the last wartime quarter), the ex-

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penditure of the government has fallen off by the equivalent of \$62 billion a yr. But this has been fully absorbed. Consumer expenditures have increased by \$20 billion, and private capital expenditures by \$18 billion, and the balance of \$24 billion is accounted for by the natural relief from the over-employment and overtime working of wartime. According to the Dept. of Commerce, "the war economy had been rather fully liquidated by the second quarter of this year" and there has been none of the mass unemployment that some American economists predicted.

THE picture is undeniably favorable. Nevertheless, there are some elements in it that may turn out to be impermanent. Consumer expenditures for goods and services, which were only about \$60 billion a yr in 1939, are now over \$120 billion. Some part of this must be due to restocking, of all kinds. Consumers are buying the things they have been unable to buy during the war and traders of all varieties are restocking their depleted shelves. But this sort of buying cannot go on forever, and one of the things that is said to have played a part in the Wall Street collapse was an official report stating that traders' inventories are already beginning to get back to normal.

The basic element in the situation can be simply expressed. In 1941, before wartime shortages began to interfere seriously with the free disposal of individual incomes, the American public saved almost

(CONTINUED ON PAGE 137)

## Alcoa, with Eye on Government, Girds for New Domestic and

### Pittsburgh

• • • Since the great bulk of government-built aluminum capacity, reduction and fabricating, has been leased or sold to companies other than the Aluminum Co. of America, the question of dissolution of Alcoa has become academic, provided actual competition continues in this vast war-expanded industry. The United States Circuit Court of Appeals, on Mar. 12, 1945, indicated that the evidence before the courts in 1940 proving Alcoa a monopoly at that time was not applicable in 1945 because the plaintiff, the United States Government, had in its hands the mechanism to prevent any possible "monopolization" of the industry after the war. That mechanism was a great network of aluminum plants throughout the country built during the war. Now, it seems that the government prefers to let things stand a while and see what competition in the industry will bring. However, with the dissolution fear at least temporarily out of the way, Alcoa still is cautious even though it is by no means a monopoly in any phase of the aluminum business.

By THOMAS E. LLOYD  
Pittsburgh Regional Editor

• • •

Today, Alcoa owns 52.4 pct of the apparent economical aluminum reduction capacity with Reynolds Metals Co. owning or controlling 30.1 pct and Kaiser controlling 17.4 pct, shown in table I. This was the one phase of the industry over which the appellate court decided that Alcoa exercised monopoly. Today, while still the largest single producer, it will have very real competition from other domestic producers plus an ever-present threat of foreign invasion of American markets, especially from the Aluminum Co. of Canada. As to alumina, Alcoa now owns 43.7 pct, against the control or ownership of 35.8 pct by Reynolds and 20.4 pct by Kaiser, as shown in table II. In this phase, Alcoa's dominance is even less marked, but being a raw material, the alumina capacity owned by Alcoa is ample to supply its reduction capacity, whereas the figures would indicate that the other producers are heavy on the raw material side.

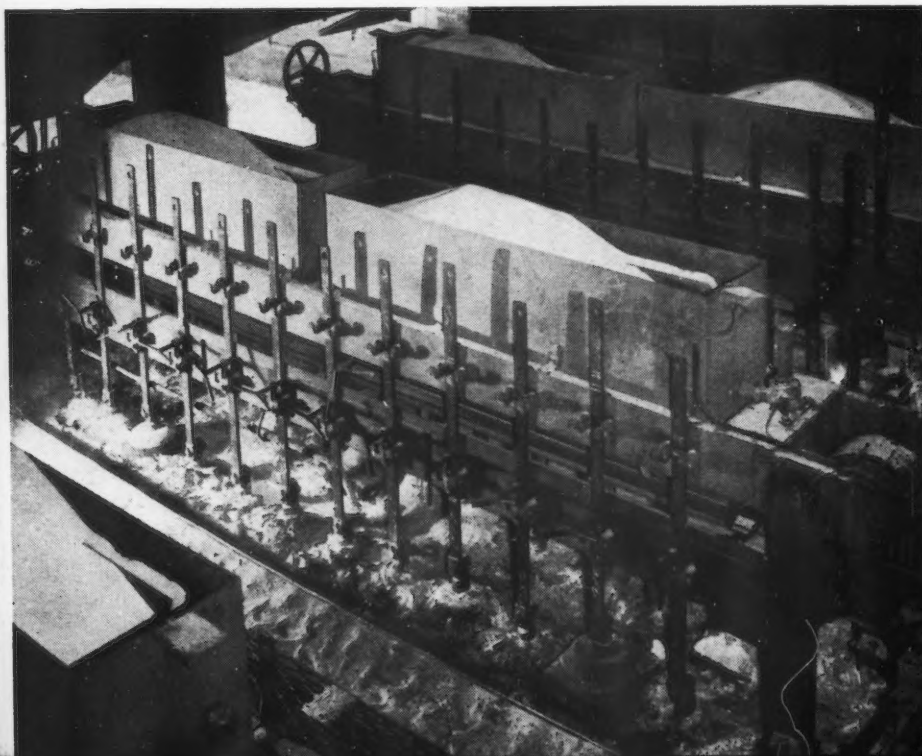
From a finished product stand-

point, probably the best measure of capacity is in flat-rolled products, specifically sheet. Alcoa owns 48.4 pct of the present sheet capacity, while the remainder is distributed: Reynolds, 29.8 pct; Kaiser, 18.4 pct; and others, 3.2 pct, as shown in table III. Alcoa's capacity will be boosted by the addition of its Davenport, Iowa, plant now under construction. Thus, while Alcoa was the sole ingot producer and easily the leading producer of aluminum finished products in 1939, government has sponsored major competition through financial aid to Reynolds and Kaiser in the form of either loans or extremely favorable lease arrangements.

Without this government-sponsored competition in the aluminum industry, Alcoa's position today would be quite perilous from a corporate standpoint. As a matter of fact, the United States Government provided the vehicle by which the court order holding out the possibility of dissolution of Alcoa could be avoided, since with government-ownership of about half of the aluminum industry at the close of the war and its disposal to producers competitive to Alcoa, any disposition on the part of the court to class the company as a monopoly would seem to have been dissipated. While the case is not completely closed, and probably won't be for some time, the attacks on Alcoa are not active.

Aside from Alcoa's industry position, but quite interesting, is the background to the disposal of the government-owned aluminum capacity. Being a pioneer and the only producer of aluminum in this country, Aluminum Co. of America went into the war in the driver's seat. It built at its own expense some \$300 million worth of facilities that tripled prewar capacity, and built and operated for the government another \$500 million worth of facilities. Alcoa officials state that more capacity would have been financed and built by Alcoa, but the government refused to let the company invest any more of its own money and insisted upon the use of government money. Roy A. Hunt, president of Alcoa, points with pride to the fact that the govern-

**ALUMINUM REDUCTION:** At Alcoa, Tenn., the Aluminum Co. of America has its largest reduction plants. Here, alumina in hoppers over the electrolytic cell, is fed onto the crust of the electrolyte. As the alumina is reduced in the bath, the crust is stirred into it. Metallic aluminum is deposited on the bottom of the cell and the oxygen in the alumina combines with the carbon of the anode and is passed off as carbon dioxide.





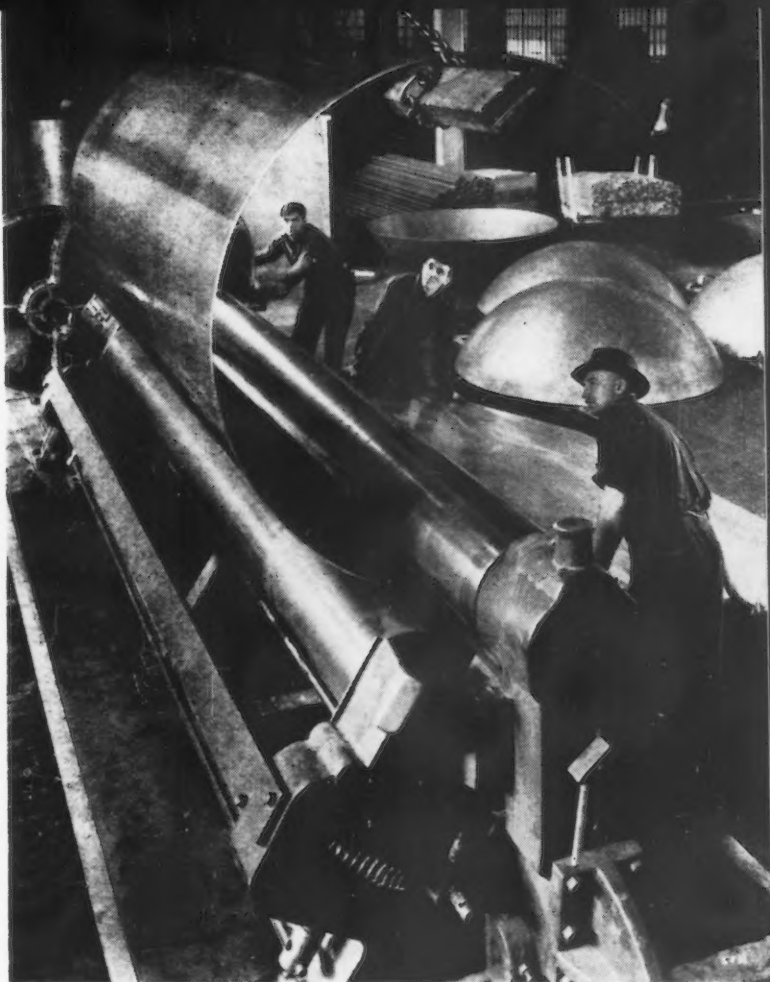
# Future Canadian Competition

ment-financed plants were built exactly on schedule and the estimates of total cost of the projects handled by Alcoa were within 10 pct of actual costs—no mean feat during a period when costs were rising and employers were bidding against each other for the available but diminishing labor supply.

Alcoa built and operated both of the government-owned alumina plants; eight of the nine government-owned ingot reduction plants; the three largest of eight extrusion plants; the larger of two rod and bar mills; the only two government sheet mills; and four of the largest forging plants built by the government. No agreements at the time of construction were made with the government for the final disposition of any of these plants, the government refusing to be involved in any sort of a purchase or option agreement with Alcoa. Alcoa officials state that governmental authorities insisted on no agreements but indicated that Alcoa's efforts would be duly noted and certainly appreciation would be shown in any and all future relations including disposition of plants.

Came the end of the war and the tune changed. Immediate attacks were made that Alcoa was using its patents to nullify attempts to dispose of the plants and to get the more desirable ones for itself. Alcoa met this charge by handing over to the government, license-free for their lives, those patents covering extraction of alumina from bauxite. This was the key log in the jam, providing a means for the disposal of Hurricane Creek, Ark., alumina plant, since aside from a limited supply of high grade bauxite near this plant, the bulk of the domestic resources are of a low grade nature. The Hurricane Creek plant leased to Reynolds started a long chain of events that included the disposal of part of the Jones Mills, Ark., reduction plant along with an option on the balance to Reynolds. Thus, Reynolds moved out of the bush league in aluminum production. From the time of the disposal of Hurricane Creek until Aug. 24, 1946, practically all of the alumina, aluminum and fabricating plants that were economically feasi-

TANK FABICATION: At its New Kensington, Pa., plant, Alcoa does a lot of its fabrication work. This tank, being shaped on roll formers, is for use in the chemical industry.



ible for operation were leased. Alcoa was thanked for its aid by being permitted to buy for cash (not leased as was the custom with other facilities) the dismantled Cressona, Pa., extrusion plant, but then only after it was found that no one else wanted it.

Other government facilities that were leased include: Phoenix, Ark., extrusion plant to Reynolds; the desirable Chicago (McCook) sheet mill to Reynolds; Spokane, Wash., (Trentwood) sheet mill to Kaiser; Spokane, Wash. (Meade) reduction plant to Kaiser; Troutdale, Ore. reduction plant to Reynolds; Baton Rouge, La., alumina plant to Kaiser; and several others. Thus, aluminum monopoly is at an end, and it

is Alcoa's honest desire that its two new competitors, Reynolds and Kaiser, stay right in business because without them government attacks are inevitable.

As to domestic competition, it is only one source of several. Alcoa expects competition from four sources, (1) domestic producers, (2) foreign producers, (3) secondary smelters (an expanding industry), and (4) other materials. Domestically, competition in aluminum fabrication has always been keen, but from here on it will be greater because of new companies and facilities coming into this field. During the war, know-how in the fabrication of aluminum became quite universal, especially in the automotive and aircraft building areas. Today, many who worked in these industries are setting up shops for the fabrication of all kinds of aluminum products. Typical is a group of young men who worked in the Marietta, Ga., bomber plant of Bell Aircraft Corp., setting up Smyrna Industries, Inc., in Atlanta, to fabricate aluminum furniture and other similar items. While before the war, Alcoa pro-

(CONTINUED ON PAGE 122)

TABLE I  
Aluminum Reduction Capacity

	Owned or Leased, Lb Per Yr	Pct of Total
Aluminum Co. of America .....	650,000,000	52.5
Reynolds Metals Co. ....	373,036,000	30.1
Kaiser Co. ....	216,030,000	17.4
Total .....	1,239,066,000	100.0

## See Labor Shortage Until Year-End With Leveling Off Early Next Year

### Cleveland

••• "An employment increase of at least 150,000 between May 15 and July 15 in Kentucky, Michigan and Ohio indicates that our previous estimate of the need for 250,000 additional workers by mid-September will be more than sub-

stantiated," J. K. Johnson, U. S. Employment Service Regional Director for the 3-state region, pointed out.

"Employment in over 3700 plants surveyed by the USES had increased by over 100,000 between mid-May and mid-July. Since

these plants represent between 50 pct and 60 pct of total employment in these states, it may safely be assumed that at least an additional 50,000 workers were added to payrolls during this 2-month pe-

*Ed. Note: The 3-state area of Ohio, Michigan and Kentucky is one of the most diversified industrial regions in the country. It is reported upon here because it is believed to represent a cross-section of employment trends.*

riod," Mr. Johnson indicated. "In addition," he said, "it is expected that another 125,000 workers will be hired between mid-July and mid-November by these 3700 establishments."

All employment indicators point to a continuing need for workers and a concomitant shortage in many occupations until the end of the year when it is anticipated employment will level off. This trend is evident in plants engaged in manufacturing as well as those in other industries.

Employers engaged in manufacturing indicated in May that they hoped to increase employment by 5.5 pct or 90,000 workers by mid-July. The actual employment increase in July amounted to only 3.4 pct or 56,000 workers. Although these data are not strictly comparable, since in May, 2000 plants were surveyed, while the July survey included 2150 plants it is still evident that employers were unable to hire the additional number of workers needed. In mid-July, the 2150 plants employed 1,715,000 workers and anticipated hiring an additional 105,000 by mid-November. This expected increase in manufacturing employment accounts for almost 85 pct of the total anticipated employment increase in all industries. The relatively large anticipated increase in manufacturing employment reverses the trend for the 6 to 9-month period immediately following VJ-Day when increased employment in nonmanufacturing activity far outshadowed that in manufacturing.

Approximately 400 plants engaged in iron and steel production experienced similar employment conditions. While the anticipated employment increase in

Actual and Anticipated Employment in 2149 Manufacturing Plants in Michigan, Ohio and Kentucky

	Number of Plants	Actual Employment		Anticipated Employment	
		May 1946	July 1946	September 1946	November 1946
Ohio.....	1134	834,400	841,000	867,900	878,500
Michigan.....	819	746,400	793,000	838,000	855,100
Kentucky.....	196	78,800	81,400	85,600	87,000
Total.....	2149	1,659,600	1,715,400	1,791,500	1,820,600

1. Approximately half of the total employment increase occurred in manufacturing plants in the region. Manufacturing plants added 56,000 workers to their payrolls between mid-May and mid-July with the largest increase—47,000—occurring in Michigan.

2. Manufacturing plants anticipate hiring an additional 105,000 workers between July and November 1946. This accounts for almost 85 pct of the 125,000 total anticipated employment increase.

3. The relatively large anticipated increase in manufacturing employment reverses the trend for the 6 to 9 month period immediately following V-J Day when increased employment in nonmanufacturing activity far outshadowed that in manufacturing.

Employment Trend in 403 Plants Engaged in Iron and Steel Production in USES Region V May-November 1946

	Number of Plants	Actual		Anticipated	
		May	July	September	November
Ohio.....	226	189,809	196,845	203,743	205,741
Michigan.....	166	87,142	90,493	96,424	97,397
Kentucky.....	21	11,995	12,639	13,092	13,460
Total.....	403	288,946	299,977	313,259	316,598

Actual and Anticipated Employment in 3746 Plants in Michigan, Ohio and Kentucky (By Sex)

	Number of Plants	Actual Employment				Anticipated Employment			
		May 1946		July 1946		September 1946		November 1946	
		Total	Female	Total	Female	Total	Female	Total	Female
Ohio.....	2183	1,118,600	301,700	1,154,700	305,700	1,185,800	314,900	1,199,500	320,300
Michigan.....	1175	897,900	188,000	956,200	195,600	1,003,900	204,100	1,025,100	209,100
Kentucky.....	408	139,100	41,100	152,100	41,400	160,200	43,900	162,900	44,700
Total.....	3746	2,155,600	530,800	2,263,000	542,700	2,349,900	562,900	2,387,500	574,100

1. Employment in over 3700 plants located in USES Region V increased by over 100,000 between mid-May and mid-July 1946. The greatest increase occurred in Michigan where more than 60,000 additional workers were added to payrolls.

2. These employers anticipate hiring an additional 125,000 workers between July and November 1946. Although female employment has shown a steep decline nationally, as well as in this region, since V-J Day, current labor shortages are partly responsible for the anticipated increase in female employment as shown on the above table. Employment of women between May and July 1946 in these plants increased by 12,000. Between July and November, however, employers expect to hire an additional 32,000 female workers, which would be an increase of 6 pct over the number employed in July.

3. Since employment in these plants represents between 50 pct and 60 pct of the total employment in the state it may be assumed that total employment increased by at least an additional 50,000 workers not shown in this table.



these plants between mid-May and mid-July amounted to 16,500, actually only 11,000 additional workers were on the payrolls in July. By mid-November these plants employing 300,000 workers in July contemplate hiring an additional 16,600.

Thirty percent of iron and steel employment is concentrated in four areas in this region, Cleveland, Cincinnati, Louisville and Detroit. Iron and steel employment increased in each of these areas, between mid-May and mid-July, by approximately 2½ pct with the largest percentage increase 6.7 pct in Cincinnati where 22 firms increased their employment by 600 workers.

Evidence of increasing labor stringencies can be seen from the inability of employers to hire the number of workers needed. Other signs point in the same direction. From the end of May to the end of August unfilled job orders in the USES offices in this region increased from 51,400 to 67,500, in spite of the fact that local employment offices were increasing the number of workers placed in jobs monthly from 45,000 in June to 50,000 in August.

At the same time, the number of workers applying for jobs at the Employment Service decreased from 350,000 to 310,000. With the increasing labor shortage, employers in this region are now hiring a greater proportion of women and handicapped workers. Between May and August, employment offices increased the placement of handicapped workers by 1000, while 12,800 women were placed in jobs in August compared with 11,500 in May.

While specific occupational shortages are found in most industries, the construction industry is especially hard hit. Shortages of bricklayers and carpenters were reported in 16 of 22 areas in the region where studies were made on labor market conditions in the construction industry in July.

Four other areas indicated that the release of building materials is certain to lead to labor shortages. In most of these areas, other construction workers, such as plumbers, electricians, plasterers and roofers, are relatively scarce and in most cases currently unavailable.

## WAA Sells 26 Pct Of Surplus War Plants In Cleveland Region

Cleveland

• • • Twenty-six percent of the nation's surplus war plants sold or leased during the month of August were located in the Cleveland Region of the War Assets Administration which includes the Pittsburgh district also and returned to the U. S. Government approximately 70 pct of the total money received for this type of surplus war holdings, it was announced. The value of the plants disposed of in the Cleveland region totaled \$67,538,609. All property of this nature sold throughout the nation amounted to \$96,325,309.

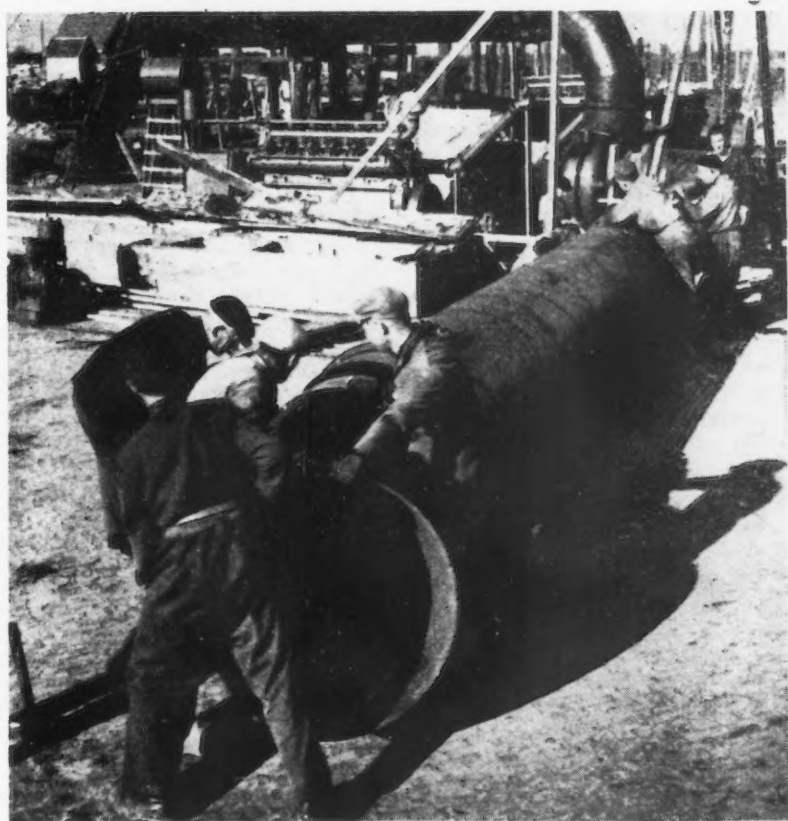
Steel plants located in Homestead, Duquesne and Braddock, Pa., acquired by the U. S. Steel Corp., accounted for the greater part of the sales. U. S. Steel during the month also purchased a fourth plant located at Geneva, Utah. The three Pennsylvania plants, disposal of which was inaugurated through the Cleveland

regional real property division, had a return value in excess of \$65,000,000. Initial payment of approximately \$12,000,000 was made on the western plant.

Other industrial establishments sold through the Cleveland regional WAA office during August included: A plant at Alliance, Ohio, purchased by the Babcock & Wilcox Tube Co., which was operated by Babcock & Wilcox during the war, consideration was \$1,315,794; a plant purchased by the National Organ Supply Co., Erie, Pa., which had been operated by the Erie Resistor Corp. during the war, consideration \$72,500; a plant operated by the Ferro Enamel Corp., Bedford, Ohio, was purchased by the Master Tool Co., Cleveland, for \$78,750.

Part of the plant of the Diamond Magnesium Co., Painesville, was sold to the Diamond Harshaw Co. for \$110,600. A plant operated by Babcock & Wilcox Tube Co., at Beaver Falls, Pa., during the war was sold to the company for \$443,465. An Ohio Crankshaft, Inc., plant, Cleveland, was sold to American Stove Co. for \$517,500.

**DRAINING HOLLAND:** American made pumps and piping are being set up in the Netherlands to help the Dutch reclaim their land after its flooding by the Nazis.



## Industrial Briefs...

• **ANNIVERSARY** — Twenty-five years of operation in Cleveland were observed by Fisher Body Div., General Motors Corp., in appropriate silver anniversary ceremonies held Sept. 26 and 27, including a special tribute to old-timers of more than 25 yr service with Fisher Body and an open house program for the public.

• **WEST COAST CHAPTER** — Mauray I. Cohen, Harry Harris Co., Kearny, N. J., national president of the Assn. of Steel Distributors, Inc. has announced the recent formation of a Pacific Coast Chapter, Zone No. 2 of the national organization. This new chapter will include in its field of organizational activity, not only northern California, but the Pacific Northwest as well. The following were elected officers: Chairman, P. Scheibner, Associated Iron & Metal Co., Oakland, Calif.; vice-chairman, Hans Popper, California Iron & Metal Co., San Francisco; secretary, P. W. Keen; treasurer, Harold Levin, Salco Iron & Metal Co., San Francisco.

• **HOLDS ELECTIONS** — C. J. Carney, Jr. has been appointed managing director of the Industrial Packaging Engineers Assn. For the last 3 yr Mr. Carney had been in charge of packaging developments for Montgomery, Ward & Co.'s retail organization. J. L. Ware has been elected treasurer of the association.

• **NEW WESTON BUILDING**—Construction has started on a new three-story engineering building containing a gross floor area of 79,000 sq ft for Weston Electrical Instrument Corp. at Newark, N. J.

• **GETS SURPLUS PLANT**—Borg-Warner Corp. has taken over the former plant run by the A. O. Smith Corp., Milwaukee, which was used for the manufacture of airplane propellers during the war. The factory consisting of seven buildings, which cost \$2 million to build, was sold to Borg-Warner for

\$1,519,548. The plant covers 59½ acres and will make automobile parts, under the new management, such as transmission gears and universal joints and other automotive transmission parts.

• **COMMUNITY CHAIRMAN** — D. H. Tilson, works manager of the Aluminum Ore Co., has been appointed East St. Louis, Ill., community chairman of the Committee for Economic Development, it was announced by Walter Fuller, president of the Curtis Publishing Co. and chairman of the newly formed CED National Information Committee.

• **NEW POTENTIOMETER** — Extensive steel processing economies are emphasized in the introduction by Brown Instrument Co. of a 25-cycle operation strip chart electronic potentiometer, designed for steel mills operating on a 25-cycle current. The new instrument, it was reported, is being introduced to meet special industry requirements. The potentiometer will be shipped this month in standard speeds, single and multiple models. Fast speed models for 25-cycle operation will be made available by the Brown company later.

• **SCREW MACHINE MOVIE** — Greenlee Bros. & Co. has a 40 min. 16 mm sound movie now available by writing the company showing the construction and operating features of the Greenlee 6-spindle automatic screw machine.

• **OSCAR FOR BRIGGS** — W. D. Robinson, president of Briggs Mfg. Co., Detroit, will receive a bronze "Oscar of Industry" at a banquet to be held in the Grand Ballroom of the Waldorf-Astoria in New York, Oct. 4, for the best annual financial report issued by an auto equipment company.

• **BURGESS BUILDS**—The Burgess Battery Co., Madison, Wis., has opened a new plant at Mineral Point, Wis., as part of its expansion program.

## CF&I Outlines Plans Of Expansion Program For Minnequa Plant

Pueblo, Colo.

••• In an address before the Pueblo Chamber of Commerce, Charles Allen, Jr., chairman of the board of directors of Colorado Fuel & Iron Corp., outlined plans for a \$5 million expansion program for the company's Minnequa plant. Mr. Allen cited some of the benefits that have resulted from the merger of the Wickwire Spencer Steel Co. into CF&I on Oct. 22, 1945.

Mr. Allen stated, "The merger added new manufacturing plants in the eastern division, brought new and diversified products, expanded the company's market area, and placed CF&I on a basis of national importance. The combined operations of the CF&I, Wickwire and California Wire Cloth plants rank tenth in size in the industry from the standpoint of ingot capacity, and eleventh in size from the standpoint of total assets."

Mr. Allen pointed out that total current assets of the company were \$25 million on Sept. 30, 1945, and on June 30, 1946, were over \$30 million. Total assets were increased from \$53 million to \$73 million. Net value of plant equipment was increased from \$29 million to \$42 million. CF&I's monthly payroll for its western operation in December 1945, was \$1,769,053 and now is over \$2,200,000. Total number of employees in all western operations increased from 9269 in December, 1945, to almost 10,000 at the present time.

"As of June 1946," Mr. Allen continued, "the estimated value of approved expenditures for improvements and additions to properties of the CF&I in all divisions, totaled almost \$7 million, over 80 pct of which has been planned for the company's Pueblo plant and its western operations."

Mr. Allen made the statement that CF&I has the largest backlog of unfilled orders in its history, and concluded "CF&I will continue to expand its facilities with new equipment and new products for both western and other steel markets throughout the country."



## Construction Steel...

### New York

• • • The estimated total bookings of fabricated structural steel for the month of August 1946, according to reports received by the American Institute of Steel Construction, amounted to 161,567 tons, or some 30,000 tons larger than the bookings for the months of June or July. The estimated total for the first eight months of the year was 1,264,435 tons, or an increase of 32.1 pct over the average of 956,887 tons booked for the same period in the 5 pre-war years 1936-40.

August shipments totaling 145,137 tons, were the largest for any month reported this year. The shipments for the 8 months amounting to 924,953 tons, were practically the same as the average reported for the same months in the 5 prewar years.

Following is the complete tabulation of bookings and shipments:

	Estimated Total Tonnage for the Entire Industry 1946	Estimated Total Tonnage for the Entire Industry Avg. 1936-40
Contracts Closed		
January .....	235,817	107,578
February .....	132,707	96,280
March .....	173,871	124,558
April .....	128,671	110,783
May .....	165,290	126,237
June .....	131,010	125,335
July .....	135,502*	152,481
August .....	161,567	113,135
Total .....	1,264,435	956,887
Shipments		
January .....	107,490	92,578
February .....	63,803	88,626
March .....	102,803	115,031
April .....	122,511	123,650
May .....	124,408	123,225
June .....	126,850	129,969
July .....	131,951*	127,422
August .....	145,137	136,389
Total .....	924,953	936,890
Tonnage available for fabrication within the next 4 months .....	651,461	350,517

\*Revised

### • • • Fabricated steel awards this week included the following:

- 5200 Tons, New York, for subway roof 108, section 12, to Carnegie Illinois Steel Corp., Pittsburgh, Pa.
- 700 Tons, Gary, Ind., blast furnace No. 4, Carnegie-Illinois Steel to John Mohr & Son.
- 400 Tons, Northumberland County, Pa., Pennsylvania Dept. of Highways, bridges, to Phoenix Bridge Co., Phoenixville, Pa.
- 300 Tons, Chicago Heights, Ill., storage building for American Locomotive Co., which was reported to have been awarded to J. T. Ryerson & Son was in error. Award made to Wendnagle & Co., Chicago, through Sumner. S. Sollitt & Co., Chicago, general contractor.
- 244 Tons, Denver, Col., motor-driven gate hoists for Davis Dam, Bureau of Reclamation, Spec. 1252, to Western Machinery Corp., Portland.
- 242 Tons, Denver, Col., structural steel siding, roofing, etc., for warehouse, Davis Dam, Bureau of Reclamation, Spec. 1250, to American Bridge Co., Pittsburgh, Pa.
- 165 Tons, Toledo, Ohio, E. I. du Pont de Nemours Co., building, to Clinton Bridge Works, Clinton, Iowa.
- 160 Tons, San Francisco, steel plates and shapes, Purchaser of Supplies, City of San Francisco, Inv. 3664 and 3665, to Taylor & Spotswood Co.

### • • • Fabricated Steel inquiries this week included the following:

- 1500 Tons, Warren, Pa., generating station for Pennsylvania Electric Co., through Gilbert Associates, Reading, Pa.
- 800 Tons, Elk Horn, Wyo., gas station for Stanolind Oil & Gas Co. Stone & Webster Engineering Corp., Boston engineers.
- 350 Tons, Souderton, Pa., Paulsboro Co., building, bids in.
- 350 Tons, Passaic County, N. J., New Jersey Dept. of Highways, bridge, Union Building & Construction Co., low bidder.
- 130 Tons, Carbon City, Pa., Pennsylvania Dept. of Highways, bridge, rejected for rebidding Oct. 18.
- 125 Tons, Buffalo, bus garage for International Railway Co., to Bethlehem Steel Co., Bethlehem, Pa., George W. Walker & Sons, Inc., contractor.
- 110 Tons, Bridgeport, Conn., Sharples Co., building, through Barclay White, general contractor.
- 100 Tons, Snyder County, Pa., Pennsylvania Dept. of Highways, bridge, H. R. Miller Co., low bidder.

### • • • Reinforcing bar awards this week included the following:

1160 Tons, Savannah, Ga., water treatment plant for City of Savannah, to Virginia Steel Co., Birmingham.

### • • • Reinforcing bar inquiries this week included the following:

555 Tons, Los Angeles, undercrossing, Hollywood Parkway at Silver Lake Blvd., California Div. Highways, Los Angeles, bids to Oct. 24.

## All-Aluminum Bridge Span Is Installed

Massena, N. Y.

• • • The first all-aluminum bridge span has been installed on the new Grasse River bridge of the Massena Terminal Railroads here. It was designed by the Aluminum Co. of America, with Hardesty and Hanover as consultants, and fabricated by the Bethlehem Steel Co. at Rankin, Pa. The 100-ft span weighs only 53,000 lb as compared to 128,000 lb for similar steel spans.

Although the Grasse River bridge marks the first time an entire bridge span was constructed of aluminum, the metal was used in 1933 to replace the steel and wood floor of the Smithfield St. bridge in Pittsburgh. This cut the weight of the bridge floor in half, and made it safe for traffic. The aluminum in this bridge is said to be still in excellent condition.

## Awards Hoists Contract

Washington

• • • The Bureau of Reclamation has awarded to the McKiernan-Terry Corp., Harrison, N. J., a \$128,362 contract for six hydraulic hoists for operating gates at the pump inlets of the Grand Coulee Dam.

Blast Furnace Capacity and Production—Net Tons

	Number of Companies	Annual Blast Furnace Capacity	PRODUCTION							
			PIG IRON		FERRO-MANGANESE AND SPIEGEL		TOTAL			
			August	Year to Date	August	Year to Date	August	Year to Date	Pct of Capacity	
									August	Year to Date
DISTRIBUTION BY DISTRICTS:										
Eastern.....	12	12,988,970	923,385	5,016,059	22,485	141,193	945,870	5,157,252	85.7	59.6
Pittsburgh-Youngstown.....	16	25,939,940	1,912,416	10,471,785	26,366	95,158	1,938,782	10,566,943	88.0	61.2
Cleveland-Detroit.....	7	6,557,500	504,378	3,029,449			504,378	3,029,449	90.5	69.4
Chicago.....	7	14,093,510	1,056,715	5,876,162			1,056,715	5,876,162	88.2	62.6
Southern.....	9	4,924,670	319,246	1,968,210	11,884	65,860	331,130	2,034,070	79.1	62.0
Western.....	5	2,836,000	121,105	743,517			121,105	743,517	50.3	39.4
TOTAL.....	37	67,340,590	4,837,245	27,105,182	60,735	302,211	4,897,980	27,407,393	85.6	61.1

\* Adjusted.

Source: American Iron & Steel Institute

# MACHINE TOOLS

... News and Market Activities

## O'Mahoney Highlights WAA Disposal Faults

... Senator Joseph C. O'Mahoney's report on the sale of surplus through agents, with the exception of an unhappy statement that the 12½ pct commissions paid dealer-agents by War Assets Administration is somewhat higher than the usual rate for the machine tool industry, struck a responsive chord in many segments of the machine tool industry which echoed an immediate "amen."

The Surplus Property Subcommittee, of which Sen. O'Mahoney is chairman, put a representative finger on some of the foibles in WAA's surplus machine tool disposal program which advisory committees have been rather ineffectually hacking away at for months. In particular, the report singled out the following points in WAA dealer-agent disposal for improvement.

**Excessive Number of Agents**—The report states in some regions too many dealers seem to have been appointed . . . if sales are spread so widely that the dealer can make only sporadic sales, he tends to lose interest and treat his dealership as a sideline. Inactive dealers, now estimated to number 1500, retard sales progress by deterring intensive selling by others. Such dealers should, therefore, be eliminated.

**Inequitable Pricing**—"Pricing of

machine tools is done by the Clayton formula, which gages depreciation according to the age of the machine rather than upon its condition. This obvious pricing inequity must be corrected if the more heavily used and poorly handled machine tools are to be sold."

**Commission Without Performance of Services**—Buyers of machine tools from salesmen in WAA regional offices have, the report states, in some instances, as a friendly gesture, designated approved dealers as their salesmen, even though the dealers in question performed no sales service. The payment of a commission for services not in fact performed is unfair to other dealers and constitutes a fraud against the government.

**Delay in Payment of Commission**—"In some instances the government has been in arrears in the payment of commissions as long as 8 months. Obviously, the dealers are to be expected to exert their best efforts in disposing of surplus tools, commissions must be paid promptly by WAA."

It is generally conceded in the industry that dealers' commissions on sales of government-owned surplus tools in the lower brackets of the Clayton Formula do not cover the cost of selling, and it is not unlikely that an answer to the

statement in the report that WAA's commissions to dealers are higher than the industry's will be immediately forthcoming.

Senator O'Mahoney's report noted the wide divergence in the success with which dealers have been used in the various regions. In some regions, such as Chicago, approved dealers account for the major part of machine tool disposal; in others, such as Los Angeles, they play only a minor part.

The percentage of sales by approved dealers has risen steadily since the initiation of the dealer selling in January 1946, until in August, agents were estimated to be selling 65 pct of all machine tools.

"It is believed significant that in the case of machine tools, the rate of disposal as of June 28, 1946, was higher than the average rate for capital goods, and that this field is the only one in which WAA sells simultaneously through agents, regional offices, and spot sales."

Recent statements that WAA and its dealer-agents have been selling about as many surplus machine tools as the industry has new units gain stature accordingly.

Boring, drilling, and milling machines, lathes, etc., costing the government originally \$954,537,000 had been declared surplus on June 28, 1946. This is estimated by the Surplus Property Subcommittee to be about 75 pct of the total amount which will eventually be declared surplus. On the same date, \$256,939,000, or about 27 pct had been sold, sales proceeds amounting to \$123,403,000.

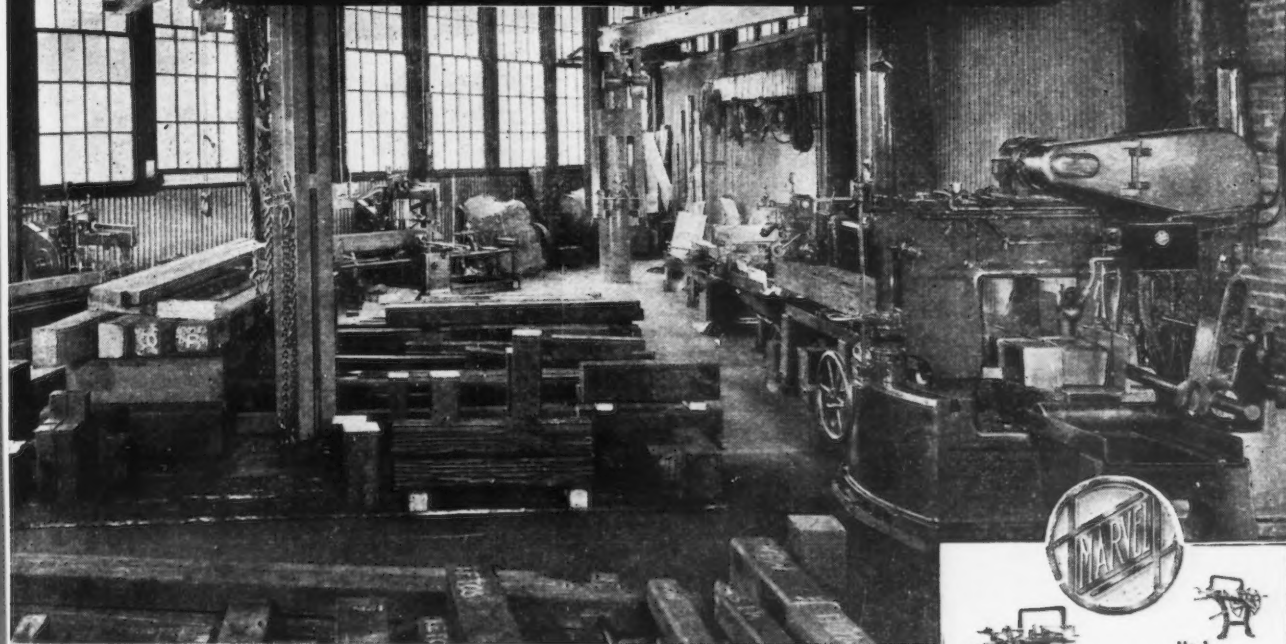
In the domestic market, WAA has been selling more machine tools than the industry, and according to some sources, this market will be further depressed for the industry if WAA cuts prices below Clayton Formula on tools in long supply, which may mean that many contractors with government-owned tools on lease will turn them back to the WAA, especially in the event of a business slump.

WAA and Private Industry Sales of Machine Tools

Month	WAR ASSETS ADMINISTRATION SALES			MACHINE TOOL * INDUSTRY SHIPMENTS	
	Original Cost	Recovery	Percent Recovery	Total Shipments	Percent Foreign
1945—June	\$4,300,000	\$2,230,000	51.2	\$41,000,000	....
July	3,105,000	1,552,000	50.0	32,500,000	....
August	3,000,000	1,017,000	33.9	32,500,000	....
September	2,510,000	1,037,000	41.1	27,300,000	24.0
October	6,112,000	2,782,000	45.5	31,200,000	19.4
November	10,403,000	5,123,000	49.2	26,000,000	17.5
December	17,696,000	8,353,000	47.2	23,200,000	20.3
1946—January	20,135,000	9,491,000	47.1	30,200,000	27.4
February	19,416,000	9,313,000	48.0	26,900,000	25.0
March	40,062,000	19,264,000	48.1	27,300,000	24.0
April	29,570,000	13,614,000	46.0	28,100,000	25.2
May	30,757,000	14,415,000	46.9	26,500,000	27.4
June	46,508,000	21,940,000	47.2	28,500,000	24.0



## Billets cut off to exact size



## ANY QUANTITY CUT-OFF AUTOMATICALLY

These MARVEL Saws are money makers for this modern forge shop in many ways. (1st) they cut off billets for a small fraction of the cost of cutting-off with a hammer. (2nd) these billets are so accurate in size that they exactly fill the dies with no excess fin, not only simplifying trimming and finishing, but getting extra billets from many bars. (3rd) they keep all hammers busy on *production* work for these "world's fastest" saws can keep ahead of any schedule. (4th) they reduce cutting-off labor costs to an absolute minimum. It takes only one operator and a helper to keep all of these saws running because all but the No. 18 Giant Hydraulic Saw (at the right) are *automatic-feed* measure, and cut-off identical billets; requiring no more attention than automatic screw machines.

Your local MARVEL Sawing Engineer will gladly call and explain how you can add these five extra profits to your forge operation.

### ARMSTRONG-BLUM MFG. CO.

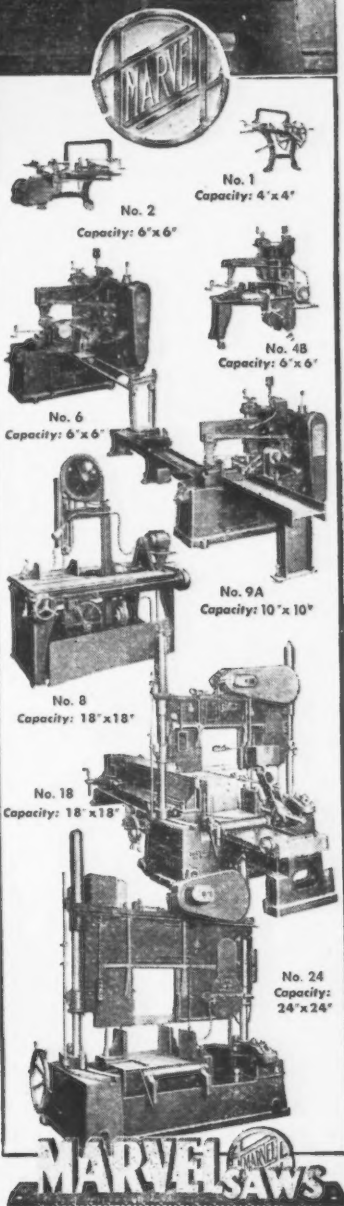
"The Hack Saw People"

5700 BLOOMINGDALE AVE.

CHICAGO 39, U. S. A.

Eastern Sales Office: 225 Lafayette St., New York 12, N. Y.

# MARVEL SAWS



# NONFERROUS METALS

... News and Market Activities

## Aluminum and Brass Deliveries Inadequate

Philadelphia

... Consumers of aluminum sheet and extrusions are finding significant difficulties in obtaining their requirements within any reasonable time. Deliveries of lighting sheet with an Alzak finish are estimated at one year. It has been necessary for some lighting sheet users to make do with Al-clad sheet which does not have a sufficiently fine finish for light reflectors.

For aluminum extrusions, the current delivery period is 20 weeks. It is reported that even when stretcher straightening has been specified in the order, roller straightened extrusions have been delivered which must be subsequently straightened by the consumer. In an effort to speed up delivery time some consumers have located new sources of supply and have arranged for anodizing. In one instance this has shown up surface impurities in the extrusions.

Consumers who have endeavored to locate their needs from government surpluses have run into considerable difficulty in locating the type and size of material needed, and even then in obtaining delivery.

While deliveries of copper and brass products are generally better than fabricated aluminum, certain sizes cannot be obtained and it has been necessary for consumers to arrange for slitting to size and to adopt many other expedients to keep plants operating.

## Copper

New York

... The OPA met with the Industry Committee here in New York last week to consider the proposed increases in shape premiums and it is understood that OPA officials were under the impression that such premiums must necessarily be tied in with the price of copper. While there was no decision taken at the meeting, it is understood that this price question is under consideration now that

there is a better understanding of the function of custom smelters and refiners in the industry. Generally speaking, there is a shortage of copper to supply the demand of industry but the shortage is extremely acute in wire bars, billets and vertically cast cakes. Custom smelters and refiners are naturally unwilling to sell such shapes at the current ceiling prices when they were produced from scrap taken in at higher than ceiling prices during the OPA inactive period. The effects of the copper strikes in mines and refineries are no longer observable and production of crude and refined copper has been stepped up significantly. Shortages in brass mill products are still significant and are based on the copper and zinc supply situations. In most instances mills are refusing to take on business from new customers. The world price of copper is said to have been established at 17¢ per lb.

## Implement Premium Plan

Washington

... Stabilization Director John R. Steelman has authorized the RFC to continue absorbing fluctuating losses under its domestic metals and minerals subsidy programs on the same basis that prevailed on June 29, 1946. A similar ruling governing RFC's foreign metal purchasing program was made on Aug. 5.

Mr. Steelman's ruling will allow the RFC greater flexibility in administering its domestic metals and minerals subsidy programs by permitting increased subsidy payment per unit, or absorption of increased loss per unit, above the amounts recorded on June 29. The Stabilization Director specified, however, that there must be no change in

the basis of operation of the programs from that in effect on June 29.

## Zinc

... The question of action on an increase in zinc prices, it is understood in the industry, has been given over by OPA to a higher authority and as yet there has been no word on any prospective action. It has not been possible to learn what recommendation was made by OPA. The Office of Metals Reserve has authorized the use of the stockpile of zinc to meet any civilian deficiency and has opened up recently on distribution of regular High Grade which has served to relieve to some extent the position of the brass mills in their needs. Galvanizers who would prefer to use Prime Western instead of any purer grade, because the small amount of impurities aids their activities, are required to pay a premium for the higher purity grades because of the shortage of Prime Western in the government stockpile. Meanwhile, exports of zinc produced domestically from foreign ores are continuing and the domestic consumers are thereby limited.

## Aluminum Price Increase

Rome

... The Italian Minister of Industry and Commerce has announced the price for primary aluminum ingots (Al content, 99 to 99.49 pct) at L.150 (66¢) per kg, with an additional L.3 (1.3¢) for special grades with aluminum content up to 99.7 pct. The change is effective from Oct. 15.

The base price converted to U.S. cents per pound is approximately 30¢ per lb.

## Nonferrous Metals Prices

Cents per pound

	Sept. 25	Sept. 26	Sept. 27	Sept. 28	Sept. 30	Oct. 1
Copper, electro., Conn. ....	14.375	14.375	14.375	14.375	14.375	14.375
Copper, Lake, Conn. ....	14.375	14.375	14.375	14.375	14.375	14.375
Tin, Straits, New York ....	52.00	52.00	52.00	....	52.00	52.00
Zinc, East St. Louis. ....	8.25	8.25	8.25	8.25	8.25	8.25
Lead, St. Louis ....	8.10	8.10	8.10	8.10	8.10	8.10



## NONFERROUS PRICES

### Primary Metals

(Cents per lb, unless otherwise noted)

Aluminum, 99+%, f.o.b. shipping point (min. 10,000 lb) .....	15.00
Aluminum pig, f.o.b. shipping point .....	14.00
Antimony, American, Laredo, Tex. .....	14.50
Beryllium copper, 3.75-4.25% Be; dollars per lb contained Be .....	\$14.75
Beryllium aluminum, 5% Be; dollars per lb contained Be .....	\$30.00
Cadmium, del'd .....	\$1.25
Cobalt, 97-99% (per lb) .....	\$1.50 to \$1.57
Copper, electro, Conn. Valley .....	14.375
Copper, electro, New York .....	14.125
Copper, lake, Conn. Valley .....	14.375
Gold, U. S. Treas., dollars per oz. .....	\$35.00
Indium, 99.8%, dollars per troy oz. .....	\$2.25
Iridium, dollars per troy oz. .....	\$125.00
Lead, St. Louis .....	8.10
Lead, New York .....	8.25
Magnesium, 99.9+%, carlots .....	20.50
Magnesium, 12-in. sticks, carlots .....	27.50
Mercury, dollars per 76-lb flask, f.o.b. New York .....	\$96 to \$99
Nickel, electro, f.o.b. refinery .....	35.00
Palladium, dollars per troy oz. .....	\$24.00
Platinum, dollars per troy oz. .....	\$93.00
Silver, New York, cents per oz. .....	90.125
Tin, Straits, New York .....	52.00
Zinc, East St. Louis .....	8.25
Zinc, New York .....	8.69
Zirconium copper, 6 pct Zr, per lb contained Zr .....	\$ 6.00

### Remelted Metals

(Cents per lb)

Aluminum, No. 12 Fdy. (No. 2) .....	13.25 to 13.50
Aluminum, deoxidizing .....	12.25 to 12.75
No. 3 .....	12.00
Brass Ingot—ceiling prices .....	
85-5-5-5 (No. 115) .....	15.75
88-10-2 (No. 215) .....	19.00
80-10-10 (No. 305) .....	18.50
No. 1 Yellow (No. 405) .....	12.75

### Copper, Copper Base Alloys

(Mill base, cents per lb)

	Extruded shapes	Rods	Sheets
Copper .....	25.66	25.81	
Copper, H.R. .....	22.16		
Copper drawn .....	23.16		
Low brass, 80% .....	24.35	24.66	
High brass .....	23.67		
Red brass, 85% .....	24.67	24.98	
Naval brass .....	23.84	22.59	28.53
Brass, free cut .....	18.53		
Commercial, bronze .....	25.50	25.81	
Manganese bronze .....	27.45	25.95	32.03
Phosphor bronze, A, .....			
B, 5% .....	43.70	43.45	
Muntz metal .....	23.59	22.34	26.78
Everdur, Herculey, .....			
Olympic or equal .....	29.82	30.88	
Nickel silver, 5% .....	34.44	32.38	
Architectural bronze .....	22.50		

### Aluminum

(Cents per lb, base, subject to extras for quantity, gage, size, temper and finish)

Drawn tubing: 2 to 3 in. OD by 0.065 in. wall: 3S, 43.5¢; 52S-O, 67¢; 24S-T, 71¢; base, 30,000 lb.

Plate: ¼ in. and heavier: 2S, 3S, 21.2¢; 52S, 24.2¢; 61S, 23.8¢; 24S, 24S-AL, 24.2¢; 75S, 75S-AL, 30.5¢; base, 30,000 lb and over.

Flat Sheet: 0.136-in. thickness: 2S, 3S, 21.7¢; 52S, 27.2¢; 61S, 24.7¢; 24S-O, 24S-OAL, 26.7¢; 75S-O, 75S-OAL, 32.7¢; base, 30,000 lb and over.

Extruded Solid Shapes: factor determined by dividing the perimeter of the shape by its weight per foot. For factor 1 through 4, 3S, 26¢; 14S, 32.5¢; 24S, 35¢; 53S, 61S, 28¢; 63S, 27¢; 75S, 45.5¢; base, 30,000 lb.

Wire, Rod and Bar: screw machine stock, rounds, 17S-T, ¼ in., 29.5¢; ½ in., 27.5¢; 1 in., 26¢; 2 in., 24.5¢; hexagons, ¼ in., 35.5¢; ½ in., 30¢; 1 in., 2 in., 27¢; base, 5000 lb. Rod: 2S, 3S, 1¼ in., 2 ½ in.

(Continued, See Next Column)

diam, rolled, 23¢; cold-finished, 23.5¢ base, 30,000 lb. Round Wire: drawn, coiled, B & S gage 17-18: 2S, 3S, 33.5¢; 56S, 39.5¢; 10,000 lb base; B & S gage 00-1: 2S, 3S, 21¢; 56S, 30.5¢; B & S 15-16: 2S, 3S, 32.5¢; 56S, 38¢; base, 30,000 lb.

### NONFERROUS SCRAP METAL QUOTATIONS

†(OPA basic maximum prices, cents per lb., f.o.b. point of shipment, subject to quality, quantity and special preparation premiums—other prices are current quotations)

#### Copper, Copper Base Alloys

##### OPA Group 1†

No. 1 wire, No. 1 heavy copper .....	11.50
No. 1 tinned copper wire, No. 1 .....	
tinned heavy copper .....	11.50
No. 2 wire, mixed heavy copper .....	10.50
Copper tuyeres .....	10.50
Light copper .....	9.50
Copper borings, No. 1 .....	11.50
No. 2 copper borings .....	10.50
Lead covered copper wire, cable .....	
Lead covered telephone, power cable .....	
Insulated copper .....	

##### OPA Group 2†

Bell metal .....	17.25
High grade bronze gears .....	15.00
High grade bronze solids .....	
Low lead bronze borings .....	
Babbitt lined brass bushings .....	14.75
High lead bronze solids .....	
High lead bronze borings .....	
Red trolley wheels .....	12.50
Tinny (phosphor bronze) borings .....	12.25
Tinny (phosphor bronze) solids .....	12.25
Copper-nickel solids and borings .....	11.00
Bronze paper mill wire cloth .....	11.25
Aluminum bronze solids .....	10.75
Soft red brass (No. 1 composition) .....	10.75
Soft red brass borings (No. 1) .....	10.75*
Gilding metal turnings .....	10.25
Contaminated gilded metal solids .....	10.25
Unlined standard red car boxes .....	10.00
Lined standard red car boxes .....	9.50
Cocks and faucets .....	9.50
Mixed brass screens .....	9.50
Red brass breakage .....	9.25
Old nickel silver solids .....	7.60
Old nickel silver borings .....	7.50
Copper lead solids, borings .....	6.75
Yellow brass castings .....	7.50
Automobile radiators .....	8.75
Zincy bronze solids, borings .....	9.75

##### OPA Group 3†

Fired rifle shells .....	9.50
Brass pipe .....	8.75
Old rolled brass .....	8.25
Admiralty condenser tubes .....	8.75
Muntz metal condenser tubes .....	8.25
Plated brass sheet, pipe reflectors .....	7.75
Manganese bronze solids .....	8.00†
Manganese bronze solids .....	7.00‡
Manganese bronze borings .....	7.25

##### OPA Group 4†

Refinery brass .....	6.00*
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\*Price varies with analysis. †Lead content 0.00 to 0.40 pct. ‡Lead content 0.41 to 1.00 pct.

### Magnesium

Sheet, rod, tubes, bars, extruded shapes subject to individual quotations. Metal turnings: 100 lb or more, 4¢ a lb; 25 to 90 lb, 5¢; less than 25 lb, 6¢.

#### Brass Mill Scrap†

Briquetted cartridge brass turnings .....	10.375
Cartridge brass turnings, loose .....	9.625
Loose yellow brass trimmings .....	9.625

### Aluminum

#### Plant scrap, segregated

2S solids .....	10.00 to 10.50
Dural alloys, solids 14, 17, 18, .....	
24S, 25S .....	8.00 to 8.50
turnings, dry basis .....	7.00 to 7.50
Low copper, alloys 51, 52, 61, .....	
63S solids .....	9.50 to 10.00
turnings, dry basis .....	8.50 to 9.00

#### Plant scrap, mixed

Solids .....	8.00 to 8.50
Turnings, dry basis .....	7.00 to 7.50

#### Obsolete scrap

Old sheet and utensils .....	9.00
Old castings and forgings .....	8.00 to 8.50
Pistons, free of struts .....	8.00

### Magnesium\*

#### Segregated plant scrap

Pure solids and all other solids, exempt .....	
Borings and turnings .....	1.50

#### Mixed, contaminated plant scrap

Grade 1 solids .....	3.00
Grade 1 borings and turnings .....	2.00
Grade 2 solids .....	2.00
Grade 2 borings and turnings .....	1.00

\*Nominal.

### Zinc

New zinc clippings, trimmings .....	7.50
Engravers, lithographers plates .....	7.50
Old zinc scrap .....	5.75
Unswaged zinc dross .....	6.00
Die cast slab .....	5.50
New die cast scrap .....	5.45
Radiator grilles, old and new .....	4.50
Old die cast scrap .....	4.00

### Lead

Deduct 1.40¢ a lb from refined metal basing point prices for refinery charge on used battery plates.

Soft lead scrap .....	7.50
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### Nickel

Ni content 98+%, Cu under ½%, 23¢ per lb; 90 to 98% Ni, 23¢ per lb contained Ni.

## ELECTROPLATING ANODES AND CHEMICALS

### Anodes

(Cents per lb, f.o.b. shipping point in 500 lb lots)

Copper, frt. allowed .....	
Cast, oval, 15 in. or longer .....	29.75
Electrodeposited .....	23.47
Rolled, oval, straight, delivered .....	23.72
Curved, 18 in. or longer, delivered .....	23.72
Brass, 80-20, frt. allowed .....	
Cast, oval, 15 in. or longer .....	27.25
Zinc, cast, 99.99, 15 in. or longer .....	17 ½
Nickel, 99 pct plus, frt. allowed .....	
Cast .....	47
Rolled, depolarized .....	48
Silver, 999 fine .....	
Rolled, 100 oz. lots, per oz. ....	95 ½

### Chemicals

(Cents per lb, f.o.b. shipping point)

Copper cyanide, 1-5 bbls .....	34.00
Copper sulphate, 99.5, crystals, bbls .....	7.75
Nickel salts, single, 425 lb bbls, frt. allowed .....	13.50
Silver cyanide, 100 oz lots, per oz. ....	0.749
Sodium cyanide, 96 pct, domestic, 125 lb drums .....	15.00
Zinc cyanide, 100 lb drums .....	33.00
Zinc sulphate, 89 pct, crystals, bbls, frt. allowed .....	6.35

# SCRAP

... News and Market Activities

## Shipments Continue at Extremely Low Level

### New York

•••Shipments of scrap through dealer channels are running close to an all time low for recent years. Direct shipments, in contrast, are gaining as mills strive to maintain high output in the face of small stockpiles. However, the overall quantity of both scrap iron and steel moving today is reported to be substantially less than that normally moved at this time of the year.

The first shot at the ban on tie-in sales was taken this week by Keystone Steel & Wire Co., Peoria, Ill., which is seeking to prove in Federal Court that OPA lacks the authority to prohibit the practice.

While the industry awaits details of the CPA inventory control plan this week the agency is continuing to move scrap by allocation — merely permitting basic openhearthers to pay low phos premiums. CPA hopes to stimu-

*Details of the 3-point Federal program to boost scrap flow appear on p. 90.*

late the flow of production scrap by reviving salvage committees; WAA is trying to step up scrap-ping of specialized machine tools; and the Dept. of Agriculture will launch a drive for farm scrap.

**PITTSBURGH**—The power strike hit scrap preparation in this area just as it has affected other industrial activity. Local yards have cut their use of electrically driven equipment, and yards in the vicinity of the metropolitan area of Pittsburgh likewise have curtailed operations. Shipments have dropped somewhat in the area to a point at some plants where they are actually lower than in some of the districts where the scrap situation has been more acute. While some consumers will dispute such a statement, some of the leading scrap dealers and brokers indicate shipments seem to be improving even though very slowly. CPA's agricultural scrap drive, hardly underway, is not expected to produce much for Pittsburgh area consumption, but may relieve the situation in other districts and permit more industrial scrap to move into this area.

**CHICAGO** — The expected pickup in cast scrap has not materialized although the consumer attitude is hopeful. The situation of the scrap industry seems to be one where hope for improvement is

much more prevalent than any increase in volume of scrap moving to the consumer. As previously predicted two large mills in this area have asked for allocations of electric furnace grade for openhearth melting which have been approved by CPA. In addition to the original allocation requested by Carnegie for electric furnace scrap to be supplied to Gary openhearthers, which was approved, this plant has requested 15,000 gross tons more to be split between Gary and South Works on which CPA has not yet acted.

**PHILADELPHIA** — Scrap movement appears to be slower this week according to dealers, and the mills are frankly concerned over the depletion of their stockpiles which should be growing for the winter. It is reported that tie-in sales are continuing in some districts although the transactions are being handled through dealers. There is apparently no enforcement of the ban. Dealers here are incensed over the recent low phos authorizations since they are being limited to previous users. This is considered to have placed a premium on earlier failure to adhere strictly to regulations. The new OPA scrap order is considered here to have had no effect except to legalize payment of higher scrap prices by mills able to obtain authorizations.

**DETROIT**—There has been a noticeable increase in volume of scrap shipments here during the past week but all observers are agreed that the increase is temporary in nature. Up to the present time there is no indication that the recent OPA rulings will add to the total volume of scrap to become available to industry. While good shipments are expected for the next 30 days it is not foreseeable at present that adequate scrap piles can be built up in steel plants and foundries to cover the winter months.

**BOSTON**—Bootlegging in cast is rampant at unconfirmed fantastic prices. Ton-nages, however, are small. Foundries are obtaining dribbling lots of low phos, and steel mills carlots of bundling materials and occasionally turnings and borings, but very little heavy steel. The general situation looks bad. Wide interest is shown in the sale of 2840 tons of Navy unprepared tank plate at Davisville, R. I., and 2000 tons of unprepared steel at the Boston Navy Yard.

**NEW YORK**—Dealers and brokers here doubt that the Government's new scrap drive will bring out much material in this area even if it proves successful elsewhere. Shipments are just as poor as they were last week and low phos continues to move out of the Eastern district. Tie-in sales are reported to be on the increase.

**CLEVELAND** — There has been little change in the scrap market here, except that virtually all openhearthers have been

granted permission by CPA to buy electric furnace scrap. Shipments are at levels only sufficient to maintain operations, collections are practically at an all-time low, and it is primarily the flow of production scrap coupled with allocations that keeps steel making operations where they are.

**ST. LOUIS**—Scrap shipments to mills in this district continue at the same low rate as last week with some holders of materials hanging onto their supplies because of low prices. Dealers also claim handling scrap is unprofitable at current labor costs. Mills are eating into inventories which are generally estimated at a 30-day level.

**CINCINNATI** — The district iron and steel scrap market is darker than at any time in years. Movement of scrap into the market has declined still further, and consumers, generally, are eating rapidly into reserves in an effort to maintain production schedules. This is a reverse of the ordinary trend during this period, when consumers are normally building inventories against the cold weather. Dealers indicate that the price situation has discouraged active collections.

**BIRMINGHAM**—Less scrap is moving here than at any time since 1940 and the trade is making no effort to improve the situation as long as the present OPA ceilings exist. The increased price granted for cast grades have failed to bring out sizable tonnages of that material locally. Scrap inventories at dealers yards and at mills are dropping to a dangerously low mark.

**TORONTO**—Scrap iron and steel receipts continue to taper off and dealers state that incoming supplies are on the decline from all sources. Further curtailment in industrial operations is reported and several more plants suspended production during the week through shortage of steel, a condition that has had a serious effect on scrap output and supply. Demand for scrap continues to expand as pig iron supply dwindles, and dealers state that they can meet less than 25 per cent of requirements for stove plate and cast scrap.

## Scrap Convention Changed

Washington

•••Believing that the times call for a business rather than a social convention, the board of directors of the Institute of Scrap Iron & Steel, Inc., has authorized the transfer of the 1947 convention of the Institute from Atlantic City to New York. The Commodore hotel will be convention headquarters and the dates are Jan. 6, 7, 8, 1947, according to an announcement by Edwin C. Barringer, president and executive secretary.



# IRON AND STEEL SCRAP PRICES

## PITTSBURGH

Per gross ton delivered to consumer:  
Cast grade f.o.b. shipping point

No. 1 hvy. melting	\$20.00*
RR. hvy. melting	21.00*
No. 2 hvy. melting	20.00*
RR. scrap rails	21.50*
Rails 3 ft. and under	23.50*
No. 1 comp'd sheets	20.00*
Hand bldd. new shts.	20.00*
Hvy. axle turn.	19.50*
Hvy. steel forge turn.	19.50*
Mach. shop turn.	15.00*
Short shov. turn.	17.00*
Mixed bor. and turn.	15.00*
Cast iron borings	16.00*
No. 1 cupola cast.	25.00*
Charging box cast.	21.00*
Heavy breakable cast.	20.00*
Burnt cast.	17.75*
Malleable	24.00*
RR. knuck. and coup.	24.50*
RR. coil springs	24.50*
Rail leaf springs	24.50*
Rolled steel wheels	24.50*
Low phos.	22.50*

## CHICAGO

Per gross ton delivered to consumer:  
Cast grades f.o.b. shipping point

No. 1 hvy. melting	\$18.75*
No. 2 hvy. melting	18.75*
No. 1 bundles	18.75*
No. 2 dealers' bndls.	18.75*
Bundled mach. shop turn.	18.75*
Galv. bundles	16.75*
Mach. shop turn.	13.75*
Short shovels, turn.	15.75*
Cast iron borings	14.75*
Mix. borings & turn.	13.75*
Low phos. hvy. forge	23.75*
Low phos. plates	21.25*
No. 1 RR. hvy. melt.	19.75*
Reroll rails	22.25*
Miscellaneous rails	20.25*
Angles & splice bars	22.25*
Locomotive tires, cut	24.25*
Cut bolsters & side frames	22.25*
Standard stl. car axles	25.75*
No. 3 steel wheels	23.25*
Couplers & knuckles	23.25*
Malleable	24.00*
No. 1 mach. cast.	20.00*
Rails 3 ft. and under	22.25*
No. 1 agricul. cast.	20.00*
Hvy. breakable cast.	20.00*
RR. grate bars	15.25*
Cast iron brake shoes	17.75*
Stove plate	23.00*
Clean auto cast.	27.00*
Cast iron carwheels	22.00*

## CINCINNATI

Per gross ton delivered to consumer:  
Cast grades f.o.b. shipping point

No. 1 hvy. melting	\$19.50*
No. 2 hvy. melting	19.50*
No. 1 bundles	19.50*
No. 2 bundles	19.50*
Mach. shop turn.	\$10.50 to 11.00
Shoveling turn.	12.50 to 13.00
Cast iron borings	11.50 to 12.00
Mixed bor. & turn.	11.50 to 12.00
Low phos. plate	22.00*
No. 1 cupola cast.	25.00*
Hvy. breakable cast.	20.00*
Stove plate	23.00*
Scrap rails	21.00*

## BOSTON

Dealers' buying prices per gross ton,  
f.o.b. cars

No. 1 hvy. melting	\$15.05*
No. 2 hvy. melting	15.05*
Nos. 1 and 2 bundles	15.05*
Busheling	15.05*
Turnings, shovellings	12.05*
Machine shop turn.	10.05*
Mixed bor. & turn.	10.05*
Cl'n cast. chem. bor.	\$13.06 to 14.15
No. 1 machinery cast.	25.00*
No. 2 machinery cast.	21.00*
Breakable cast.	20.00*
Stove plate	23.00*

## DETROIT

Per gross ton, brokers' buying prices:

No. 1 hvy. melting	\$17.32*
No. 2 hvy. melting	17.32*
No. 1 bundles	17.32*
New busheling	17.32*
Flashings	17.32*
Mach. shop turn.	12.32*
Short shov. turn.	14.32*

Going prices as obtained in the trade  
by IRON AGE editors, based on rep-  
resentative tonnages. Where asterisks  
are used they indicate the OPA  
ceiling price to which must be added  
brokerage fee and adjusted freight.

Cast iron borings	13.32*
Mixed bor. & turn.	12.32*
Low phos. plate	19.82*
No. 1 cupola cast.	25.00*
Charging box cast.	21.00*
Hvy. breakable cast.	20.00*
Stove plate	23.00*
Automotive cast.	27.00*

## PHILADELPHIA

Per gross ton delivered to consumer:  
Cast grades f.o.b. shipping point

No. 1 hvy. melting	\$18.75*
No. 2 hvy. melting	18.75*
No. 2 bundles	18.75*
Mach. shop turn.	18.75*
Shoveling turn.	15.75*
Cast iron borings	14.75*
Mixed bor. & turn.	13.75*
No. 1 cupola cast.	25.00*
Hvy. breakable cast.	20.00*
Cast. charging box	21.00*
Clean auto cast.	27.00*
Hvy. axle forge turn.	18.25*
Low phos. plate	21.25*
Low phos. punchings	21.25*
RR. steel wheels	23.25*
RR. coil springs	23.25*
RR. malleable	22.00*

## ST. LOUIS

Per gross ton delivered to consumer:  
Cast grades f.o.b. shipping point

Heavy melting	\$17.50*
Bundled sheets	17.50*
Mach. shop turn.	12.50*
Locomotive tires, uncut	21.00*
Misc. std. sec. rails	19.00*
Rerolling rails	21.00*
Steel angle bars	21.00*
Rails 3 ft. and under	21.50*
RR. springs	22.00*
Steel car axles	24.50*
Stove plate	23.00*
Grate bars	15.25*
Brake shoes	17.75*
Malleable	24.00*
Cast iron carwheels	22.00*
No. 1 mach'ry cast.	22.00*
Breakable cast.	20.00*

## BIRMINGHAM

Per gross ton delivered to consumer:  
Cast grades f.o.b. shipping point

No. 1 hvy. melting	\$17.00*
No. 2 hvy. melting	17.00*
No. 2 bundles	17.00*
No. 1 busheling	17.00*
Long turnings	12.00*
Shoveling turnings	14.00*
Cast iron borings	13.00*
Bar crops and plate	\$18.50 to 19.50*
Structural and plate	18.50 to 19.50*
No. 1 cast.	25.00*
Stove plate	23.00*
Steel axles	18.50*
Scrap rails	18.50*
Rerolling rails	20.50*
Angles & splice bars	20.50 to 21.00*
Rails 3 ft. & under	21.00*
Cast iron carwheels	22.00*

## YOUNGSTOWN

Per gross ton delivered to consumer:  
Cast grades f.o.b. shipping point

No. 1 hvy. melting	\$20.00*
No. 2 hvy. melting	20.00*
Low phos. plate	22.50*
No. 1 busheling	20.00*
Hydraulic bundles	20.00*
Mach. shop turn.	15.00*
Short shov. turn.	17.00*
Cast iron borings	16.00*

## NEW YORK

Brokers' buying prices per gross ton, on cars:

No. 1 hvy. melting	\$15.33*
No. 2 hvy. melting	15.33*
Comp. black bundles	15.33*
Comp. galv. bundles	13.33*
Mach. shop turn.	10.33*
Mixed bor. & turn.	10.33*
Shoveling turn.	12.33*
No. 1 cupola cast.	25.00*

Hvy. breakable cast.	20.00*
Charging box cast.	21.00*
Stove plate	23.00*
Clean auto cast.	27.00*
Unstrip. motor blks.	20.00*
Cl'n chem. cast bor.	14.33*

## BUFFALO

Per gross ton delivered to consumer:  
Cast grades f.o.b. shipping point

No. 1 hvy. melting	\$19.25*
No. 1 bundles	19.25*
No. 2 bundles	19.25*
No. 2 hvy. melting	19.25*
Mach. shop turn.	14.25*
Shoveling turn.	16.25*
Cast iron borings	15.25*
Mixed bor. & turn.	14.25*
No. 1 cupola cast.	25.00*
Charging box cast.	21.00*
Stove plate	23.00*
Clean auto cast.	27.00*
Malleable	24.00*
Low phos. plate	21.75*
Scrap rails	20.75*
Rails 3 ft. & under	22.75*
RR. steel wheels	23.75*
Cast iron carwheels	22.00*
RR. coil & leaf spgs.	23.75*
RR. knuckles & coup.	23.75*
No. 1 busheling	19.25*

## CLEVELAND

Per gross ton delivered to consumer:  
Cast grades f.o.b. shipping point

No. 1 hvy. melting	\$19.50*
No. 2 hvy. melting	19.50*
Compressed sheet stl.	19.50*
Drop forge flashings	19.00
No. 2 bundles	19.50*
Mach. shop turn.	14.50*
Short shov.	16.50*
No. 1 busheling	19.50*
Steel axle turn.	19.00*
Cast iron borings	15.50*
Mixed bor. & turn.	14.50*
No. 2 busheling	17.00*
No. 1 machinery cast.	25.00*
Malleable	24.00*
Railroad cast	20.00*
Railroad grate bars	15.25*
Stove plate	23.00*
RR. hvy. melting	20.50*
Rails 3 ft. & under	23.00*
Rails 18 in. & under	24.25*
Rails for rerolling	23.00*
Elec. furnace punch	22.00*

## SAN FRANCISCO

Per gross ton delivered to consumer:  
Cast grade f.o.b. shipping point

RR. hvy. melting	\$18.00*
No. 1 hvy. melting	17.00*
No. 2 hvy. melting	17.00*
No. 2 bales	\$15.00 to 15.75
No. 3 bales	8.50 to 9.25
Mach. shop turn.	6.50 to 7.25
Elec. furn. 1 ft. und.	15.50 to 17.00
No. 1 cupola cast.	19.00 to 21.00

## LOS ANGELES

Per gross ton delivered to consumer:  
Cast grade f.o.b. shipping point

No. 1 hvy. melting	\$17.00
No. 2 hvy. melting	17.00
No. 1 bales	\$16.00 to 17.00
No. 2 bales	15.50 to 16.00
No. 3 bales	8.00 to 9.00
Mach. shop turn.	7.00
No. 1 cupola cast.	19.00 to 21.00

## SEATTLE

Per gross ton delivered to consumer:  
Cast grade f.o.b. shipping point

RR. hvy. melting	\$14.50*
No. 1 & No. 2 hvy. melting	14.50*
Elec. furn. 1 ft. und.	\$14.00 to 15.00
No. 1 cupola cast.	25.00*

## HAMILTON, ONT.

Per gross ton delivered to consumer:  
Cast grades f.o.b. shipping point

Heavy melting	\$17.50*
No. 1 bundles	17.50*
No. 2 bundles	17.00*
Mixed steel scrap	15.50*
Rails, remelting	18.50*
Rails, rerolling	21.50*
Bushellings	13.00*
Mixed borings & turnings	12.50*
Electric furnace bundles	20.50*
Manganese steel scrap	20.00*
No. 1 cast	19.00*
Stove plate	17.50*
Car wheels, cast	19.50*
Malleable iron	16.00*

# Comparison of Prices . .

Advances over past week in **Heavy Type**, declines in *Italics*. Prices are f.o.b. major basing points. The various basing points for finished and semifinished steel are listed in the detailed price tables.

Flat-Rolled Steel:	Oct. 1, 1946	Sept. 24, 1946	Aug. 27, 1946	Oct. 2, 1945
(cents per pound)	1946	1946	1946	1945
Hot-rolled sheets	2.425	2.425	2.425	2.20
Cold-rolled sheets	3.275	3.275	3.275	3.05
Galvanized sheets (24 ga.)	4.05	4.05	4.05	3.70
Hot-rolled strip				
6-in and under	2.45	2.45	2.45	2.10
Over 6 in.	2.35	2.35	2.35	2.10
Cold-rolled strip	3.05	3.05	3.05	2.80
Plates	2.50	2.50	2.50	2.25
Plates, wrought iron	4.112	4.112	4.112	3.80
Stain's c-r strip (No. 302)	30.30	30.30	30.30	28.00

Tin and Ternplate:	Oct. 1, 1946	Sept. 24, 1946	Aug. 27, 1946	Oct. 2, 1945
(dollars per base box)				
Tinplate, standard cokes	\$5.00	\$5.00	\$5.00	\$5.00
Tinplate, electro (0.50 lb)	4.50	4.50	4.50	4.50
Special coated mfg. ternes	4.30	4.30	4.30	4.30

Bars and Shapes:	Oct. 1, 1946	Sept. 24, 1946	Aug. 27, 1946	Oct. 2, 1945
(cents per pound)				
Merchant bars	2.50	2.50	2.50	2.25
Cold-finished bars	3.10	3.10	3.10	2.75
Alloy bars	2.92	2.92	2.92	2.70
Structural shapes	2.35	2.35	2.35	2.10
Stainless bars (No. 302)	25.97	25.97	25.97	24.00
Wrought iron bars	4.76	4.76	4.76	4.40

Wire and Wire Products:	Oct. 1, 1946	Sept. 24, 1946	Aug. 27, 1946	Oct. 2, 1945
(cents per pound)				
Bright wire	3.05	3.05	3.05	2.75
Wire nails	3.75	3.75	3.75	2.90

Rails:	Oct. 1, 1946	Sept. 24, 1946	Aug. 27, 1946	Oct. 2, 1945
(dollars per net ton)				
Heavy rails	\$43.39	\$43.39	\$43.39	\$43.00*
Light rails	49.18	49.18	49.18	45.00*
*per gross ton				

Semifinished Steel:	Oct. 1, 1946	Sept. 24, 1946	Aug. 27, 1946	Oct. 2, 1945
(dollars per gross ton)				
Rerolling billets	\$39.00	\$39.00	\$39.00	\$36.00
Sheet bars	38.00	38.00	38.00	36.00
Slabs, rerolling	39.00	39.00	39.00	36.00
Forging billets	47.00	47.00	47.00	42.00
Alloy blooms, billets, slabs	58.43	58.43	58.43	54.00

Wire Rods and Skelp:	Oct. 1, 1946	Sept. 24, 1946	Aug. 27, 1946	Oct. 2, 1945
(cents per pound)				
Wire rods	2.30	2.30	2.30	2.15
Skelp	2.05	2.05	2.05	1.90

Pig Iron*:	Oct. 1, 1946	Sept. 24, 1946	Aug. 27, 1946	Oct. 2, 1945
(per gross ton)				
No. 2 foundry, Phila.	\$30.43	\$30.43	\$30.43	\$26.84
No. 2, Valley furnace	28.50	28.50	28.50	25.00
No. 2, Southern, Cin'ti.	27.80	27.80	27.80	25.44
No. 2, Birmingham	24.88	24.88	24.88	21.38
No. 2 foundry, Chicago†	28.50	28.50	28.50	25.00
Basic, del'd eastern Pa.	29.93	29.93	29.93	26.34
Basic, Valley furnace	28.00	28.00	28.00	24.50
Malleable, Chicago†	28.50	28.50	28.50	25.00
Malleable, Valley	28.50	28.50	28.50	25.00
L. S. charcoal, Chicago	42.34	42.34	42.34	42.34
Ferromanganese‡	135.00	135.00	135.00	135.00

† The switching charge for delivery to foundries in the Chicago district is 60¢ per ton.  
‡ For carlots at seaboard.

\* Prices retroactive to May 29; the price increase should be reflected in THE IRON AGE Comparison of Prices table since June 4.

Scrap:	Oct. 1, 1946	Sept. 24, 1946	Aug. 27, 1946	Oct. 2, 1945
(per gross ton)				
Heavy melt'g steel, P'gh.	\$20.00	\$20.00	\$20.00	\$20.00
Heavy melt'g steel, Phila.	18.75	18.75	18.75	18.75
Heavy melt'g steel, Ch'go	18.75	18.75	18.75	18.75
No. 1 hy. comp. sheet, Det.	17.32	17.32	17.32	17.32
Low phos. plate, Youngs'n	22.50	22.50	22.50	22.50
No. 1 cast, Pittsburgh	25.00	25.00	25.00	20.00
No. 1 cast, Philadelphia	25.00	25.00	25.00	20.00
No. 1 cast, Chicago	25.00	25.00	25.00	20.00

Coke, Connellsville:	Oct. 1, 1946	Sept. 24, 1946	Aug. 27, 1946	Oct. 2, 1945
(per net ton at oven)				
Furnace coke, prompt	\$8.75	\$8.75	\$8.75	\$7.50
Foundry coke, prompt	8.50	8.50	8.50	9.00

Nonferrous Metals:	Oct. 1, 1946	Sept. 24, 1946	Aug. 27, 1946	Oct. 2, 1945
(cents per pound to large buyers)				
Copper, electro., Conn.	14.375	14.375	14.375	12.00
Copper, Lake, Conn.	14.375	14.375	14.375	12.00
Tin, Straits, New York	52.00	52.00	52.00	52.00
Zinc, East St. Louis	8.25	8.25	8.25	8.25
Lead, St. Louis	8.10	8.10	8.10	6.35
Aluminum, virgin	15.00	15.00	15.00	15.00
Nickel, electrolytic	35.00	35.00	35.00	35.00
Magnesium, ingot	20.50	20.50	20.50	20.50
Antimony, Laredo, Tex.	14.50	14.50	14.50	14.50

Starting with the issue of Apr. 22, 1943, the weighted finished steel index was revised for the years 1941, 1942 and 1943. See explanation of the change on p. 90 of the Apr. 22, 1943, issue. Index revised to a quarterly basis as of Nov. 16, 1944; for details see p. 98 of that issue. The finished steel composite prices for the current quarter are an estimate based on finished steel shipments for the previous quarter. These figures will be revised when the actual data of shipments for this quarter are compiled.

# Composite Prices . .

FINISHED STEEL	Oct. 1, 1946	Sept. 24, 1946	Aug. 27, 1946	Oct. 2, 1945
One week ago	2.73011¢	2.73011¢	2.73011¢	2.73011¢
One month ago	2.73011¢	2.73011¢	2.73011¢	2.73011¢
One year ago	2.44076¢	2.44076¢	2.44076¢	2.44076¢

HIGH	LOW
1946... 2.73011¢ July 4	2.54490¢ Jan. 1
1945... 2.44104¢ Oct. 2	2.38444¢ Jan. 2
1944... 2.30837¢ Sept. 5	2.21189¢ Oct. 5
1943... 2.29176¢	2.29176¢
1942... 2.28249¢	2.28249¢
1941... 2.43078¢	2.43078¢
1940... 2.30467¢ Jan. 2	2.24107¢ Apr. 16
1939... 2.35367¢ Jan. 3	2.26689¢ May 16
1938... 2.58414¢ Jan. 4	2.27207¢ Oct. 18
1937... 2.58414¢ Mar. 9	2.32263¢ Jan. 4
1936... 2.32263¢ Dec. 28	2.05200¢ Mar. 10
1935... 2.07642¢ Oct. 1	2.06492¢ Jan. 8
1934... 2.15367¢ Apr. 24	1.95757¢ Jan. 2
1933... 1.95578¢ Oct. 3	1.75836¢ May 2
1932... 1.89196¢ July 5	1.83901¢ Mar. 1
1931... 1.99626¢ Jan. 13	1.86586¢ Dec. 29
1930... 2.25488¢ Jan. 7	1.97319¢ Dec. 9
1929... 2.31773¢ May 28	2.26498¢ Oct. 29

Weighted index based on steel bars, shapes, plates, wire, rails, black pipe, hot and cold-rolled sheets and strip, representing 78 pct of the United States output. Index recapitulated in Aug. 28, 1941, issue.

PIG IRON	Oct. 1, 1946	Sept. 24, 1946	Aug. 27, 1946	Oct. 2, 1945
One week ago	\$28.13	\$28.13	\$28.13	\$28.13
One month ago	\$28.13	\$28.13	\$28.13	\$28.13
One year ago	\$24.61	\$24.61	\$24.61	\$24.61

HIGH	LOW
\$28.13 May 29	\$25.37 Jan. 1
25.37 Oct. 23	23.61 Jan. 2
\$23.61	\$23.61
23.61	23.61
23.61	23.61
\$23.61 Mar. 20	\$23.45 Jan. 2
23.45 Dec. 23	22.61 Jan. 2
22.61 Sept. 19	20.61 Sept. 12
23.25 June 21	19.61 July 6
23.25 Mar. 9	20.25 Feb. 16
19.74 Nov. 24	18.73 Aug. 11
18.84 Nov. 5	17.83 May 14
17.90 May 1	16.90 Jan. 27
16.90 Dec. 5	13.56 Jan. 3
14.81 Jan. 5	13.56 Dec. 6
15.90 Jan. 6	14.79 Dec. 15
18.21 Jan. 7	15.90 Dec. 16
18.71 May 14	18.21 Dec. 17

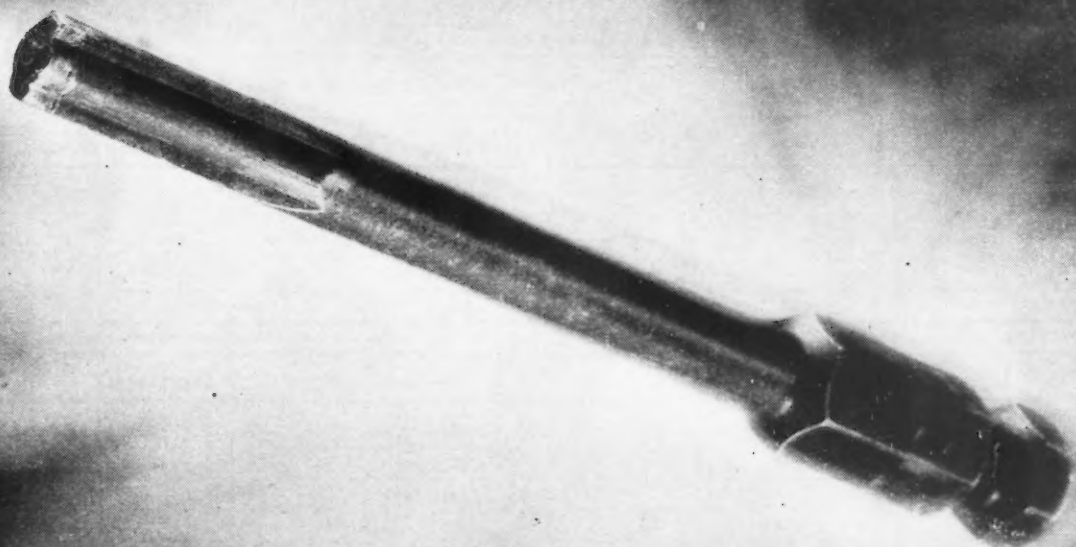
Based on averages for basic iron at Valley furnaces and foundry iron at Chicago, Philadelphia, Buffalo, Valley and Birmingham.

SCRAP STEEL	Oct. 1, 1946	Sept. 24, 1946	Aug. 27, 1946	Oct. 2, 1945
One week ago	\$19.17	\$19.17	\$19.17	\$19.17
One month ago	\$19.17	\$19.17	\$19.17	\$19.17
One year ago	\$19.17	\$19.17	\$19.17	\$19.17

HIGH	LOW
\$19.17	\$19.17
\$19.17 Jan. 2	\$18.92 May 22
19.17 Jan. 11	15.76 Oct. 24
\$19.17	\$19.17
19.17	19.17
\$22.00 Jan. 7	\$19.17 Apr. 10
21.83 Dec. 30	16.04 Apr. 9
22.50 Oct. 3	14.08 May 16
15.00 Nov. 22	11.00 June 7
21.92 Mar. 30	12.67 June 9
17.75 Dec. 21	12.67 June 8
13.42 Dec. 10	10.33 Apr. 29
13.00 Mar. 13	9.50 Sept. 25
12.25 Aug. 8	6.75 Jan. 3
8.50 Jan. 12	6.43 July 5
11.33 Jan. 6	8.50 Dec. 29
15.00 Feb. 18	11.25 Dec. 9
17.58 Jan. 29	14.08 Dec. 3

Based on No. 1 heavy melting steel scrap quotations to consumers at Pittsburgh, Philadelphia, and Chicago.





TYPE "A"  
ASSEMBLY BIT

COMMON  
SCREWDRIVER

## This Bit DROVE 214,000 SCREWS IN CONTINUOUS OPERATION

This amazing record of durability was rolled up on an assembly line of the largest automobile corporation in the world.

It is a stock bit, taken out of production shipment and was used in a power driver on  $\frac{5}{16}$ "-24x $\frac{7}{8}$ " flat CLUTCH HEAD door hinge screws . . . an operation calling for unusually high torque driving.

It is important to note that this bit served continuously on the assembly line . . . *that there was no interruption for reconditioning* during this 214,000 driving spell.

Moreover, this bit can be *repeatedly restored to its original efficiency* by a simple application of the end surface to a grinding wheel.

Package assortment of CLUTCH HEAD Screws and sample Type "A" Bit sent on request

Tool economy is only one of the many exclusive advantages offered by CLUTCH HEAD for faster, safer, and lower-cost assembly operation. Investigate them.



Check the perfect operation of this screw with an ordinary type screwdriver or any flat blade, reasonably accurate in width. Thickness of the blade is secondary.

**UNITED SCREW AND BOLT CORPORATION**

CLEVELAND 2

CHICAGO 8

NEW YORK 7

Steel prices shown here are f.o.b. basing points, in cents per pound or dollars per gross ton. Extras apply. Delivered prices do not reflect 8 pct tax on freight. (1) Mill run sheet, 10¢ per 100 lb under base; primes, 25¢ above base. (2) Unassorted commercial coating. (3) Widths up to 12-in. inclusive. (4) 0.25 carbon and less. (5) Applies to certain width and length limitations. (6) For merchant trade. (7) For straight length material only from producer to consumer. Discount of 25¢ per 100 lb to fabricators. (8) Also shafting. For quantities of 20,000 lb to 39,999 lb. (9) Carload lot in manufacturing trade. (10) Prices do not apply if rail and water is not used. (11) Boxed. (12) This base price for annealed, bright finish wires, commercial spring wire. (13) Produced to dimensional tolerances in AISI Manual Sect. 6. (14) Billets only. (15) 9/32 in. to 47/64 in., 0.15¢ per lb higher.

Ingot  
Bloom  
Slabs  
Billet  
Billet  
N.  
Bars,  
FL.  
Bars,  
FL.  
Plate  
Shape  
Sheet  
Strip,  
Strip,  
Wire  
Wire  
Rod,  
Tubing

An inc

Straight  
Tungst

Special

Ward  
electronic

10

Bağ

100

Armatu

### Electric Motor

## Dynam

Transfo

Transfer

F.o.b.

10¢ per  
cluding

der 100

1

10

No. 1

Angle A  
(Feb)

Light  
Light

2.

Screw

The pla

Track

Track 1

Basin

plates—

City, N.

Steelton  
Young

Oregon



# PRICES

## CORROSION AND HEAT RESISTANT STEELS

In cents per pound, f.o.b. basing point

BASING POINT	Chromium Nickel		Straight Chromium			
	No. 304	No. 302	No. 410	No. 430	No. 442	No. 446
Ingot, P'gh, Chi, Canton, Balt, Reading, Ft. Wayne, Phila.	Subject to negotiation	Subject to negotiation	Subject to negotiation	Subject to negotiation	Subject to negotiation	Subject to negotiation
Blooms, P'gh, Chi, Canton, Phila, Reading, Ft. Wayne, Balt.	22.99	24.67	17.01	17.47	20.69	25.29
Slabs, P'gh, Chi, Canton, Balt, Phila, Reading	22.99	24.67	17.01	17.47	20.69	25.29
Billets P'gh, Chi, Canton, Newark, N. J., Watervliet, Syracuse, Balt.	Subject to negotiation	Subject to negotiation	Subject to negotiation	Subject to negotiation	Subject to negotiation	Subject to negotiation
Billets, forging, P'gh, Chi, Canton, Dunkirk, Balt, Phila, Reading, Watervliet, Syracuse, Newark, N. J., Ft. Wayne, Titusville.	22.99	24.67	17.01	17.47	20.69	25.29
Bars, h-r, P'gh, Chi, Canton, Dunkirk, Watervliet, Newark, N. J., Syracuse, Balt, Phila, Reading, Ft. Wayne, Titusville.	27.06	25.97	20.02	20.56	24.34	29.75
Bars, c-f, P'gh, Chi, Cleva, Canton, Dunkirk, Newark, N. J., Syracuse, Balt, Phila, Reading, Ft. Wayne, Watervliet.	27.05	25.97	20.02	20.56	24.34	29.75
Plates, P'gh, Middletown, Canton.	31.38	29.21	23.28	23.80	28.67	33.00
Shapes, structural, P'gh, Chi.	27.06	26.97	20.02	20.56	24.34	29.75
Sheets, P'gh, Chi, Middletown, Canton, Balt.	38.96	36.79	28.67	31.38	35.16	38.49
Strip, h-r, P'gh, Chi, Reading, Canton, Youngstown.	25.43	23.28	18.39	18.93	25.97	37.87
Strip, c-f, P'gh, Cleva, Newark, N. J., Reading, Canton, Youngstown.	32.46	30.30	23.80	24.34	34.82	36.28
Wire, flat, c-r, Cleva, Dunkirk, Syracuse, Balt, Reading, Canton, P'gh, Newark, N. J., Phila.	27.05	25.97	20.02	20.56	24.34	29.75
Wire, flat, c-r, Cleva, Balt, Reading, Dunkirk, Canton.	32.46	30.30	23.80	24.34	34.82	36.28
Rod, h-r, Newark, N. J., Syracuse.	27.05	25.97	20.02	20.56	24.34	29.75
Tubing, seamless, P'gh, Chi, Canton, (4 in. to 6 in.)	72.09	72.09	.....	68.49	.....	.....

## TOOL STEEL

(F.o.b. Pittsburgh, Bethlehem, Syracuse, Dunkirk. \*Also Canton, O.)

An increase of 8.2 pct applies to base price and extras

	Base per lb
High speed .....	67¢
Straight molybdenum .....	54¢
Tungsten-molybdenum .....	57½¢
High-carbon-chromium* .....	43¢
Oil hardening* .....	24¢
Special carbon* .....	22¢
Extra carbon* .....	18¢
Regular carbon* .....	14¢
Warehouse prices on and east of Mississippi are 2¢ per lb higher; west of Mississippi 3¢ higher.	

## ELECTRICAL SHEETS

Base, all grades f.o.b. Pittsburgh

	per lb
Field grade .....	3.90¢
Armature .....	4.25¢
Electrical .....	4.75¢
Motor .....	5.425¢
Dynamo .....	6.125¢
Transformer 72 .....	6.625¢
Transformer 65 .....	7.625¢
Transformer 58 .....	8.125¢
Transformer 52 .....	8.925¢

F.o.b. Chicago and Gary, field grade through motor; f.o.b. Granite City, add 10¢ per 100 lb on field grade to and including dynamo. Pacific ports add 75¢ per 100 lb on all grades.

## RAILS, TRACK SUPPLIES

(F.o.b. mill)

Standard rails, heavier than 60 lb No. 1 O.H., net ton .....	\$43.39
Angle splice bars, 100 lb .....	2.85
(F.o.b. basing points) per net ton	
Light rails (from billets) .....	\$49.13
Light rails (from rail steel) .....	49.13
base per lb	
Cut spikes .....	3.65¢
Screw spikes .....	*5.15¢
Tie plate, steel .....	2.55¢
Tie plates, Pacific Coast .....	2.70¢
Track bolts .....	6.50¢
Track bolts, heat treated, to railroads .....	6.75¢
Track bolts, jobbers discount .....	63-5
*Plus 12 pct.	
Basing points, light rails, Pittsburgh, Chicago, Birmingham; cut spikes and tie plates—Pittsburgh, Chicago, Portsmouth, Ohio, Weirton, W. Va., St. Louis, Kansas City, Minnequa, Colo., Birmingham and Pacific Coast ports; tie plates alone—Steelton, Pa., Buffalo. Cut spikes alone—Youngstown, Lebanon, Pa., Richmond, Oregon and Washington ports, add 25¢.	

## ROOFING TERNEPLATE

(F.o.b. Pittsburgh, 112 sheets)

	20x14 in.	20x28 in.
8-lb coating I.C. ....	\$8.50	\$17.00
15-lb coating I.C. ....	9.50	19.00
20-lb coating I.C. ....	10.00	20.00

## CLAD STEEL

Base prices, cents per pound

	Plate	Sheet
Stainless-clad		
No. 304, 20 pct, f.o.b. Pittsburgh, Washington, Pa. ....	21.00*	22.00
Nickel-clad		
10 pct, f.o.b. Coatesville, Pa. ....	18.72	....
Inconel-clad	....	....
10 pct, f.o.b. Coatesville ..	26.00	....
Monel-clad	....	....
10 pct, f.o.b. Coatesville ..	24.96	....
Aluminized steel		
Hot dip, 20 gage, f.o.b. Pittsburgh .....	9.00	....

\*Includes annealing and pickling.

## WIRE PRODUCTS

To the dealer, f.o.b. Pittsburgh, Chicago, Cleveland, Birmingham, Duluth

	Basing Points	Pacific Coast Basing Points
base per keg		
Standard wire nails .....	\$3.75	\$4.25
Coated nails .....	3.75	4.25
Cut nails, carloads ....	4.85	....
base per 100 lb		
Annealed fence wire .....	\$3.50	\$4.00
Annealed galv. fence wire ..	3.85	4.35
base column		
Woven wire fence* ....	72	90
Fence posts, carloads ..	74	91
Single loop bale tie† ..	72	97
Galvanized barbed wire**	79	89
Twisted barless wire ..	79	89
*15½ gage and heavier. **On 80-rod spools in carload quantities.		
†Prices subject to switching or transportation charges.		
‡Add 50¢ a ton.		

## HIGH TENSILE, LOW ALLOY STEELS

base prices, cents per pound

Steel	Aldecor	Corten	Double Strength No. 1	Dynalloy	Hi Steel	Mayari R	Otis-cloy	Yoloy	Y-50
Producer	Republic	Carnegie-Illinois, Republic	Republic	Alan Wood	Inland	Bethlehem	Jones & Laughlin	Youngstown Sheet & Tube	American Rolling Mill
Plates .....	3.45	3.45	3.45	3.45	3.45	3.45	3.45	3.45	....
Sheets									
Hot-rolled .....	3.575	3.575	3.575	3.575	3.575	3.575	3.575	3.575	....
Cold-rolled .....	4.525	4.525	4.525	....	4.525	4.525	4.525	4.525	5.225*
Galvanized .....	....	....	....	....	....	5.50	....	....	....
Strip									
Hot-rolled									
Over 6-in. ...	3.60	3.60	3.60	....	3.60	3.60	3.60	3.60	....
6-in & under	3.70	3.70	3.70	....	3.70	3.70	3.70	3.70	....
Cold-rolled ..	4.30	....	4.30	....	4.40	....	4.30	4.30	5.00*
Commodity ..	....	....	....	....	....	....	4.45	....	....
Shapes .....	....	3.45	....	....	3.45	3.45	3.45	3.45	....
Beams .....	....	3.45	....	....	....	3.45	....	....	....
Bars									
Hot-rolled .....	3.70	3.70	3.70	....	....	3.70	3.70	3.732††	....
Cold-rolled .....	....	....	....	....	....	....	....	4.382††	....
Bar shapes .....	....	3.85	....	....	3.85	3.85	3.85	3.85	....
Billets, blooms, slabs (per gross ton)									
Structural .....	....	....	....	....	....	....	....	\$74.65†	....
Forging .....	....	....	....	....	....	....	....	\$82.23†	....

\* 21 gage and lighter. heat treating grade.

† Alloy extras apply.

‡ Add 0.379¢ for forging or

## PRICES

### WELDED PIPE AND TUBING

Base discounts, f.o.b. Pittsburgh district and Lorain, Ohio, mills

(F.o.b. Pittsburgh only on wrought pipe)  
Base price—\$200.00 per net ton

#### Steel (butt-weld)

	Black	Galv.
1/4-in. ....	60 1/2	48
3/4-in. ....	63 1/2	52
1-in. to 3-in. ....	65 1/2	54 1/2

#### Wrought Iron (butt-weld)

		+4%
1/4-in. ....	17 1/2	
3/4-in. ....	24 1/2	2%
1-in. and 1 1/4-in. ....	28 1/2	9 1/2
1 1/2-in. ....	33	11 1/2
2-in. ....	32 1/2	11 1/2

#### Steel (lap-weld)

		46 1/2
2-in. ....	58	
2 1/2-in. and 3-in. ....	61	49 1/2
3 1/2-in. to 6-in. ....	63	51 1/2

#### Wrought Iron (lap-weld)

		4%
2-in. ....	24 1/2	
2 1/2-in. to 3 1/2-in. ....	25 1/2	7 1/2
4-in. ....	28 1/2	11 1/2
4 1/2-in. to 8-in. ....	27	10 1/2

#### Steel (butt, extra strong, plain ends)

		47 1/2
1/4-in. ....	58 1/2	
3/4-in. ....	62 1/2	51 1/2
1-in. to 3-in. ....	64	54

#### Wrought Iron (same as above)

		+1 1/2%
1/4-in. ....	18 1/2	
3/4-in. ....	25 1/2	4 1/2
1-in. to 2-in. ....	33	13

#### Steel (lap, extra strong, plain ends)

		45 1/2
2-in. ....	56	
2 1/2-in. and 3-in. ....	60	49 1/2
3 1/2-in. to 6-in. ....	63 1/2	53

#### Wrought Iron (same as above)

		8%
2-in. ....	28 1/2	
2 1/2-in. to 4-in. ....	34	16 1/2
4 1/2-in. to 6-in. ....	32 1/2	14 1/2

On butt-weld and lap-weld steel pipe jobbers are granted a discount of 5 pct. On l.c.l. shipments prices are determined by adding 25 pct and 30 pct and the carload freight rate to the base card.

F.o.b. Gary prices are two points lower discount or \$4 a ton higher than Pittsburgh or Lorain on lap-weld and one point lower discount, or \$2 a ton higher on all butt-weld.

### BOILER TUBES

Seamless steel and lap-weld commercial boiler tubes and locomotive tubes, minimum wall. Net base prices per 100 ft f.o.b. Pittsburgh, in carload lots

	Seamless	Lap-weld
	Cold-Drawn	Hot-Rolled
2 in. O.D. 13 B.W.G. ....	16.52	13.90
2 1/2 in. O.D. 12 B.W.G. ....	22.21	18.70
3 in. O.D. 12 B.W.G. ....	24.71	20.79
3 1/2 in. O.D. 11 B.W.G. ....	31.18	26.25
4 in. O.D. 10 B.W.G. ....	38.68	32.56

(Extras for less carload quantities)  
40,000 lb or ft and over.....Base  
30,000 lb or ft to 39,999 lb or ft.... 5 pct  
20,000 lb or ft to 29,999 lb or ft.... 10 pct  
10,000 lb or ft to 19,999 lb or ft.... 20 pct  
5,000 lb or ft to 9,999 lb or ft.... 30 pct  
2,000 lb or ft to 4,999 lb or ft.... 45 pct  
Under 2,000 lb or ft..... 65 pct

### CAST IRON WATER PIPE

	Per net ton
6-in. to 24-in., del'd Chicago.....	\$70.33
6-in. to 24-in., del'd New York.....	69.60
6-in. to 24-in., Birmingham.....	61.00
6-in. and larger, f.o.b. cars, San Francisco, Los Angeles or Seattle for all rail shipment; rail and water shipment less.....	84.40
Class "A" and gas pipe, \$5 extra; 4-in. pipe is \$5 a ton above 6-in.	

### BOLTS, NUTS, RIVETS, SET SCREWS

An increase of 12 pct applies to listings except Large Rivets

#### Bolts and Nuts

(F.o.b. Pittsburgh, Cleveland, Birmingham or Chicago)

#### Machine and Carriage Bolts

	Base discount less case lots	Percent Off List
1/4 in. & smaller x 6 in. & shorter....	65 1/2	
9/16 & 5/8 in. x 6 in. & shorter....	63 1/2	
3/4 to 1 in. x 6 in. & shorter....	61	
1 1/4 in. and larger, all lengths....	59	
All diameters over 6 in. long....	59	
Lag. all sizes ....	62	
Plow bolts ....	65	

#### Nuts, Cold Punched or Hot Pressed

	(Hexagon or Square)
1/4 in. and smaller ....	62
9/16 to 1 in. inclusive ....	59
1 1/4 to 1 1/2 in. inclusive ....	57
1 1/2 in. and larger ....	56
On above bolts and nuts, excepting plow bolts, additional allowance of 10 pct for full container quantities. There is an additional 5 pct allowance for carload shipments.	

#### Semifin. Hexagon Nuts U.S.S. S.A.E.

	Base discount less keg lots	
7/16 in. and smaller ....	62	64
1/2 in. and smaller ....	62	
3/4 in. through 1 in. ....	59	60
9/16 in. through 1 in. ....	59	
1 1/4 in. through 1 1/2 in. ....	57	58
1 1/2 in. and larger ....	56	
In full keg lots, 10 pct additional discount. For 200 lb or more, freight allowed up to 50¢ per 100 lb, based on Cleveland, Chicago, Pittsburgh.		

#### Stove Bolts

	Consumer
Packages, nuts loose ....	71 and 10
In packages ....	71
In bulk ....	80
On stove bolts freight allowed up to 65¢ per 100 lb based on Cleveland, Chicago, New York on lots of 200 lb or over.	

#### Large Rivets

	(1/2 in. and larger)	Base per 100 Lb
F.o.b. Pittsburgh, Cleveland, Chicago, Birmingham ....		\$4.75
F.o.b. Lebanon, Pa. ....		4.90

#### Small Rivets

	(7/16 in. and smaller)	Percent Off List
F.o.b. Pittsburgh, Cleveland, Chicago, Birmingham ....		65 and 5

#### Cap and Set Screws

	(In packages)	Consumer
Upset full fin, hexagon head cap screws, coarse or fine thread, up to and incl. 1 in. x 6 in. ....		64
Upset set screws, cup and oval points		71
Milled studs ....		46
Flat head cap screws, listed sizes....		36
Fillister head cap, listed sizes....		51
Freight allowed up to 65¢ per 100 lb based on Cleveland, Chicago or New York on lots of 200 lb or over.		

### FLUORSPAR

Maximum price f.o.b. consumer's plant, \$30 per short ton plus either (1) rail freight from producer to consumer, or (2) rail freight from Rosiclare, Ill., to consumer, whichever is lower.

	Base price per short ton
Effective CaF <sub>2</sub> Content: 70% or more .....	\$33.00
65% but less than 70% .....	32.00
60% but less than 65% .....	31.00
Less than 60% .....	30.00

### LAKE SUPERIOR ORES

(51.50% Fe, Natural Content, Delivered Lower Lake Ports)

	Per Gross Ton
Old range, bessemer ....	\$5.45
Old range, non-bessemer ....	5.30
Mesaba, bessemer ....	5.20
Mesaba, non-bessemer ....	5.05
High phosphorus ....	5.05

Prices are for ore shipped on and after June 24, 1946, and for ore covered by adjustable pricing agreements authorized by Order No. 8, RMPR 113. These prices do not reflect the recent ICC increase in freight rates.

### METAL POWDERS

Prices in cents per pound in ton lots, f.o.b. shipping point.

Brass, minus 100 mesh..19 1/4¢ to 21 1/4¢	
Copper, electrolytic, 100 and 375 mesh .....	23 1/2¢ to 27 1/2¢
Copper, reduced, 150 and 200 mesh .....	22 1/2¢
Iron, commercial, 100, 200, 325, mesh 96 + % Fe.....	11¢ to 14¢
Swedish sponge iron, 100 mesh, a.l.f. N. Y., carlots, ocean bags....	7.4¢ to 8¢
Iron, crushed, 200 mesh and finer, 90 + % Fe carload lots.....	4¢
Iron, hydrogen reduced, 300 mesh and finer, 98 + % Fe, drum lots .....	6 1/2¢
Iron, electrolytic, unannealed, 325 mesh and coarser, 99 + % Fe. 25¢ to 31¢	
Iron, electrolytic, annealed minus 100 mesh, 99 + % Fe .....	17¢
Iron carbonyl, 300 mesh and finer, 98-99.8 + % Fe .....	90¢ to \$1.75
Aluminum, 100, 200 mesh, carlots .....	25¢
Antimony, 100 mesh .....	30¢
Cadmium, 100 mesh .....	\$1.75
Chromium, 100 mesh and finer.....	\$1.35
Lead, 100, 200 & 300 mesh.13 1/4¢ to 16 1/4¢	
Manganese, minus 325 mesh and coarser .....	4.4¢ to 6 1/2¢
Nickel, 150 mesh .....	51 1/2¢
Silicon, minus 325 mesh and coarser .....	26¢ to 55¢
Solder powder, 100 mesh..8 1/2¢ plus metal	
Tin, 100 mesh .....	58 1/2¢
Tungsten metal powder, 98% 99%, any quantity, per lb.....	\$2.60
Molybdenum powder, 99%, in 100-lb kegs, f.o.b. York, Pa., per lb..	\$2.65
Under 100 lb.....	\$2.90

### COKE

	Net Ton
Furnace, beehive (f.o.b. oven)	
Connellsville, Pa. ....	\$8.75
Connellsville, Pa., hand drawn ..	9.35
Foundry, beehive (f.o.b. oven)	
Fayette Co., W. Va. ....	8.10
Connellsville, Pa. ....	8.50
Foundry, Byproduct	
Chicago, del'd .....	15.10
Chicago, f.o.b. ....	14.35
New England, del'd .....	16.04
Kearny, N. J., f.o.b. ....	14.40
Philadelphia, del'd .....	14.63
Buffalo, del'd .....	14.75
Portsmouth, Ohio, f.o.b. ....	12.85
Painesville, Ohio, f.o.b. ....	13.50
Erie, del'd .....	14.50
Cleveland, del'd .....	14.55
Cincinnati, del'd .....	14.60
St. Louis, del'd .....	15.10
Birmingham, del'd .....	12.25

†Except producers situated in states other than Missouri, Alabama or Tennessee, sellers may charge a maximum delivered price of \$15.60 in the St. Louis Mo., and East St. Louis, Ill., switching districts.

### REFRACTORIES

(F.o.b. Works)

	Per 1000
Fire Clay Brick	
Super-duty brick, St. Louis.....	\$76.05
First quality, Pa., Md., Ky., Mo., Ill., Ohio .....	60.40
First quality, New Jersey .....	65.30
Sec. quality, Pa., Md., Ky., Mo., Ill. ....	54.80
Sec. quality, New Jersey .....	57.70
Sec. quality, Ohio .....	52.35
Ground fire clay, net ton, bulk....	8.55

	Per Net Ton
Silica Brick	
Pennsylvania and Birmingham.....	\$60.40
Chicago District .....	69.10
Silica cement, net ton (Eastern)....	10.00

	Per Net Ton
Chrome Brick	
Standard chemically bonded, Balt., Plymouth Meeting, Chester .....	\$54.00

	Per Net Ton
Magnesite Brick	
Standard, Balt. and Chester .....	\$76.00
Chemically bonded, Baltimore .....	65.00

	Per Net Ton
Grain Magnesite	
Domestic, f.o.b. Balt. and Chester in sacks .....	\$44.80
Domestic, f.o.b. Chewelah, Wash., in bulk .....	22.00
in sacks .....	26.00
Clinker (dead burned) dolomite, bulk, per net ton, f.o.b. York, Pa. ....	10.00



# PRICES

## WAREHOUSE PRICES

Delivered metropolitan areas, per 100 lb.

Cities	SHEETS			STRIP			Plates 1/4 in. and heavier	Structural Shapes	BARS		ALLOY BARS			
	Hot-Rolled (10 gage)	Cold-Rolled	Galvanized (24 gage)	Hot-Rolled 6 in. and Under	Hot-Rolled Over 6 in.	Cold-Rolled			Hot-Rolled	Cold-Finished	Hot-Rolled, A-8617-20	Hot-Rolled, A-8742-50 Ann.	Cold-Drawn, A-8617-20	Cold-Drawn, A-8742-50 Ann.
Philadelphia.....	\$3.774	\$5.139	\$5.249*	\$4.314	\$4.214	\$5.064	\$3.875	\$3.937	\$4.114	\$4.564	\$6.287	\$7.387	\$7.664	\$8.764
New York.....	3.856	4.869	5.501	4.375	4.275	5.075	4.049	4.038	4.134	4.584	6.338	7.438	7.684	8.784
Boston.....	4.05	5.031	5.725	4.518	4.418	4.985	4.203	4.023	4.356	4.656	6.503	7.603	7.756	8.856
Baltimore.....	3.84	5.118	5.365	4.293	4.193	5.065	3.865	4.05	4.093	4.543	.....	.....	.....	.....
Norfolk.....	4.037	.....	5.862	4.577	4.477	.....	4.262	4.303	4.377	4.677	.....	.....	.....	.....
Chicago.....	.....	.....	.....	.....	.....	4.90*	.....	.....	.....	.....	.....	.....	.....	.....
Chicago.....	3.633	4.583	5.558	4.108	4.008	5.058*	3.958	3.958	3.908	4.358	6.308	7.408	7.458	8.558
Milwaukee.....	3.575	.....	5.347	3.95	3.85	.....	3.65	3.88	3.60	4.20	6.277	7.377	7.20	8.30
Cleveland.....	3.575	4.625	5.20	4.211	4.111	4.961	3.921	3.85	3.60	4.20	6.05	7.15	7.20	8.30
Buffalo.....	3.675	4.725	5.491	4.05	3.95	.....	3.900	3.952	3.70	4.25	6.421	7.521	7.55	8.65
Cincinnati.....	3.671	4.721	5.296	4.046	3.946	5.002	3.952	3.983	3.902	4.502	6.441	7.541	7.602	8.702
St. Louis.....	3.643	4.593	5.622	4.118	4.018	5.222	3.968	3.968	3.918	4.522	6.472	7.572	7.622	8.722
Pittsburgh.....	3.575	4.625	.....	3.95	3.85	.....	3.65	3.65	3.60	4.20	6.05	7.15	7.20	8.30
St. Paul.....	3.817	4.767	5.666	4.292	4.192	5.000	4.142	4.142	4.092	4.852	.....	6.322	7.952	8.052
Duluth.....	3.817	4.767	5.666	4.292	4.192	.....	4.142	4.142	4.092	.....	6.472	6.572	.....	.....
Omaha.....	4.045	5.72	6.00	4.52	4.42	.....	4.37	4.37	4.32	4.945	.....	.....	.....	.....
Indianapolis.....	3.775	4.825	5.40	4.15	4.05	5.03	3.92	3.92	3.87	4.47	6.17	.....	7.32	.....
Birmingham.....	3.675	.....	5.20	4.05	3.95	.....	3.80	3.80	3.75	4.954	6.414	7.514	7.564	8.614
Memphis.....	4.221	.....	5.746	4.596	4.496	.....	4.346	4.346	4.296	4.821	.....	.....	.....	.....
New Orleans.....	4.324*	5.365 <sup>1</sup>	5.849	4.699	4.599	.....	4.449	4.449*	4.399*	5.14	.....	.....	.....	.....
Los Angeles.....	4.85	6.60 <sup>1</sup>	6.55	5.30	5.20	.....	4.80	4.70	4.65	6.03	.....	.....	.....	.....
San Francisco.....	4.40	6.00	6.55	4.85	4.75	.....	4.50	4.35	4.40	5.78	.....	.....	.....	.....
Seattle.....	4.875 <sup>2</sup>	7.27 <sup>2</sup>	6.40	4.60	4.50	.....	5.00 <sup>5</sup>	4.70 <sup>5</sup>	4.60 <sup>5</sup>	6.23	7.70 <sup>5</sup>	8.70 <sup>5</sup>	.....	9.55 <sup>5</sup>
Portland.....	4.874 <sup>4</sup>	.....	6.20	5.10	.....	.....	5.00 <sup>4</sup>	4.70 <sup>4</sup>	4.70 <sup>4</sup>	5.98	7.70	8.85	.....	.....
Salt Lake City.....	4.81	.....	6.70	5.94	5.84	.....	5.29	5.29	5.19	6.49	.....	.....	.....	.....

## BASE QUANTITIES

Standard unless otherwise keyed on prices.

**HOT-ROLLED:** Sheets, strip, plates, shapes and bars, 400 to 1999 lb.

**COLD-ROLLED:** Sheets, 400 to 1999 lb; strip, extras on all quantities; bars, 1500 lb and over.

**ALLOY BARS:** 1000 to 39,999 lb.

**GALVANIZED SHEETS:** 450 to 1499 lb.

**EXCEPTIONS:** (1) 400 to 1499 lb; (2) 450 to 1499 lb; (3) 450 to 3749 lb; (4) 300 to 4999 lb; (5) 300 to 10,000 lb; (6) 2000 lb and over; (7) 3500 lb and over; (8) 1000 lb and over.

(\*) Philadelphia: Galvanized sheet, 25 or more bundles.

Extra for size, quality, etc., apply on above quotations.

\* Add 29.1¢ for sizes not rolled in Birmingham.

\*\* City of Philadelphia only. Applicable freight rates must be added to basing point prices to obtain delivered price to other localities in metropolitan area.

## PIG IRON PRICES

Per gross ton, retroactive to May 29.

BASING POINT PRICES						DELIVERED PRICES (BASE GRADES)							
Basing Point	Basic	No. 2 Foundry	Malleable	Bessemer	Low Phos.	Consuming Point	Basing Point	Freight Rate	Basic	No. 2 Foundry	Malleable	Bessemer	Low Phos.
Bethlehem.....	29.00	29.50	30.00	30.50	34.00	Boston.....	Everett.....	\$0.50 Arb.	29.50	30.00	30.50	31.00	38.47
Birdsboro.....	29.00	29.50	30.00	30.50	34.00	Boston.....	Birdsboro-Steelton...	4.47	.....	.....	.....	.....	38.47
Birmingham.....	23.50*	24.88*	.....	29.50	.....	Brooklyn.....	Bethlehem.....	2.78	31.78	32.28	32.78	33.28	37.28
Buffalo.....	27.50	28.50	29.00	29.50	34.00	Brooklyn.....	Birdsboro.....	3.26	.....	.....	.....	.....	37.28
Chicago.....	28.00	28.50	29.00	29.50	.....	Canton.....	Clev. Ygstr, Sharpvil.	1.54	29.54	30.04	30.04	30.54	37.55
Cleveland.....	28.00	28.50	29.00	29.50	.....	Canton.....	Buffalo.....	3.55	.....	.....	.....	.....	37.55
Detroit.....	28.00	28.50	29.00	29.50	.....	Cincinnati.....	Birmingham.....	4.30	27.80*	29.18*	.....	.....	38.89
Duluth.....	28.50	29.00	29.50	29.50	.....	Cincinnati.....	Hamilton.....	1.24	.....	29.74	.....	.....	38.89
Erie.....	28.00	28.50	29.00	29.50	.....	Cincinnati.....	Buffalo.....	4.89	.....	.....	.....	.....	38.89
Everett.....	29.00	29.50	30.00	30.50	.....	Jersey City.....	Bethlehem.....	1.70	30.70	31.20	31.70	32.20	38.16
Granite City.....	28.00	28.50	29.00	29.00	.....	Jersey City.....	Birdsboro.....	2.16	.....	.....	.....	.....	38.16
Hamilton.....	28.00	28.50	29.00	29.00	.....	Los Angeles.....	Provo.....	5.25	31.25	31.75	.....	.....	50.33
Neville Island.....	28.00	28.50	29.00	29.00	.....	Los Angeles.....	Buffalo.....	16.33	.....	.....	.....	.....	50.33
Provo.....	26.00	26.50	.....	.....	.....	Mansfield.....	Cleveland-Toledo.....	2.16	30.16	30.66	30.66	31.16	37.74
Sharpsville.....	28.00	28.50	29.00	29.00	.....	Mansfield.....	Buffalo.....	3.74	.....	.....	.....	.....	37.74
Sparrows Point.....	29.00	29.50	.....	.....	.....	Philadelphia.....	Swedeland.....	0.93	29.93	30.43	30.93	31.43	35.38
Steelton.....	29.00	.....	.....	.....	34.00	Philadelphia.....	Birdsboro.....	1.38	.....	.....	.....	.....	35.38
Swedeland.....	29.00	29.50	30.00	30.50	.....	San Francisco.....	Provo.....	5.25	31.25	31.75	.....	.....	50.33
Toledo.....	28.00	28.50	29.00	29.00	.....	San Francisco.....	Buffalo.....	16.33	.....	.....	.....	.....	50.33
Youngstown.....	28.00	28.50	29.00	29.00	.....	Seattle.....	Provo.....	5.25	31.25	31.75	.....	.....	50.33
						Seattle.....	Buffalo.....	16.33	.....	.....	.....	.....	50.33
						St. Louis.....	Granite City.....	0.50 Arb.	28.50	29.00	29.00	29.50	41.98
						St. Louis.....	Buffalo.....	7.86	.....	.....	.....	.....	41.98

Republic Steel Corp. has been granted a \$2 increase on basic and foundry pig iron produced at Birmingham.

(1) Struthers Iron & Steel Co., Struthers, Ohio, may charge 50¢ per ton in excess of basing point prices for No. 2 foundry, basic, Bessemer and malleable.

Charcoal pig iron base prices for Lyles, Tenn., and Lake Superior furnaces, \$33.00 and \$34.00, respectively. Newberry Brand of Lake Superior charcoal iron \$39.00 per g.t., Lake Superior furnace. Delivered to Chicago, \$42.34.

High phosphorus iron sells at Lyles, Tenn., at \$28.50.

Basing point prices are subject to switching charges; silicon differentials (not to exceed 50¢ per ton for each 0.25 pct silicon content in excess of base grade which is 1.75 to 2.25 pct); phosphorus differentials, a reduction of 38¢ per ton for phosphorus content of 0.70 pct and over; manganese differentials, a charge not to exceed 50¢ per ton for each

0.50 pct manganese content in excess of 1.00 pct. \$2 per ton extra may be charged for 0.5 to 0.75 pct nickel content and \$1 per ton extra for each additional 0.25 pct nickel.

Silvery iron, silicon 6.00 to 6.50 pct, C/L per g.t., f.o.b. Jackson, Ohio—\$34.00; f.o.b. Buffalo—\$35.25. Add \$1.00 per ton for each additional 0.50 pct Si. Add 50¢ per ton for each 0.50 pct Mn over 1.00 pct. Add \$1.00 per ton for prices of comparable analysis.

# FERROALLOY PRICES

## Ferromanganese

78-82% Mn, maximum contract base price, gross ton, lump size, f.o.b. Baltimore, Philadelphia, New York, Birmingham, Rockdale, Rockwood, Tenn.  
 Carload lots (bulk) ..... \$135.00  
 Less ton lots (packed) ..... 148.50  
 F.o.b. Pittsburgh ..... 139.50  
 \$1.70 for each 1% above 82% Mn; penalty, \$1.70 for each 1% below 78%.  
 Briquets—cents per pound of briquet, freight allowed, 66% contained Mn.  
 Eastern Central Western  
 Carload, bulk .. 6.05 6.30 6.60  
 Ton lots ..... 6.65 7.55 8.55  
 Less ton lots ... 6.80 7.80 8.80

## Spiegeleisen

Contract prices, gross ton, lump, f.o.b. Palmerton, Pa.  
 16-19% Mn 19-21% Mn  
 3% max. Si 3% max. Si  
 Carloads ..... \$35.00 \$36.00  
 Less ton ..... 47.50 48.50  
 F.o.b. Pittsburgh, Chicago ..... 40.00

## Manganese Metal

Contract basis, lump size, cents per pound of metal, f.o.b. shipping point, freight allowed, eastern zone.  
 96% min. Mn, 0.2% max. C, 1% max. Si, 2% max. Fe.  
 Carload, bulk ..... 30  
 L.c.l. lots ..... 32

## Electrolytic Manganese

F.o.b. Knoxville, Tenn., freight allowed east of Mississippi, cents per pound.  
 Carloads ..... 32  
 Ton lots ..... 34  
 Less ton lots ..... 36

## Low-Carbon Ferromanganese

Contract price, cents per pound Mn contained, lump size, f.o.b. shipping point, freight allowed, eastern zone.  
 Carloads Ton Less  
 0.10% max. C, 0.06% P, 90% Mn ..... 21.00 21.40 21.65  
 0.10% max. C ..... 20.50 20.90 21.15  
 0.15% max. C ..... 20.00 20.40 20.65  
 0.30% max. C ..... 19.50 19.90 20.15  
 0.50% max. C ..... 19.00 19.40 19.65  
 0.75% max. C .....  
 7.00% max. Si ..... 16.00 16.40 16.65

## Silicomanganese

Contract basis, lump size, cents per pound of metal, f.o.b. shipping point, freight allowed. 65-70% Mn, 17-20% Si, 1.5% max. C.  
 Carload, bulk ..... 6.05  
 Ton lots ..... 6.70  
 Briquet, contract basis, carlots, bulk freight allowed, per lb of briquet. 5.80  
 Ton lots ..... 6.30  
 Less ton lots ..... 6.55

## Silvery Iron (electric furnace)

Si 14.01 to 14.50%, \$51.25 f.o.b. Keokuk, Iowa; \$48.00 f.o.b. Jackson, Ohio; \$49.25 f.o.b. Niagara Falls. Add \$1.00 per ton for each additional 0.50% Si up to and including 18%. Add \$1.00 per ton for low impurities, not to exceed: P—0.05%, S—0.04%, C—1.00%.

## Silicon Metal

Contract price, cents per pound contained Si, lump size, f.o.b. shipping point, freight allowed, for ton lots, packed.  
 Eastern Central Western  
 96% Si, 2% Fe.. 13.10 13.55 16.50  
 97% Si, 1% Fe.. 13.45 13.90 16.80

## Ferrosilicon Briquets

Contract price, cents per pound of briquet, bulk, f.o.b. shipping point, freight allowed to destination, 40% Si.  
 Eastern Central Western  
 Carload, bulk .. 3.60 3.75 3.90  
 Ton lots ..... 4.05 4.55 4.60  
 Less ton lots .. 4.45 4.80 4.85

## Electric Ferrosilicon

Contract price, cents per pound contained Si, lump size in carloads, f.o.b. shipping point, freight allowed.  
 Eastern Central Western  
 50% Si ..... 7.05 7.50 7.65  
 75% Si ..... 8.55 8.70 9.25  
 80-90% Si ..... 9.50 9.65 10.15  
 90-95% Si ..... 11.80 11.95 12.40

## Ferrochrome

(65-72% Cr, 2% max. Si)  
 Contract prices, cents per pound, contained Cr, lump size in carloads, f.o.b. shipping point, freight allowed.  
 Eastern Central Western  
 0.06% C ..... 23.00 23.40 24.00  
 0.10% C ..... 22.50 22.90 23.50  
 0.15% C ..... 22.00 22.40 23.00  
 0.20% C ..... 21.50 21.90 22.50  
 0.50% C ..... 21.00 21.40 22.00  
 1.00% C ..... 20.50 20.90 21.50  
 2.00% C ..... 19.50 19.90 20.50  
 66-71% Cr .....  
 4-10% C ... 14.50 14.90 15.00  
 62-66% Cr .....  
 5-7% C ... 15.05 15.45 15.55  
 Briquets—contract price, cents per pound of briquet, f.o.b. shipping point, freight allowed, 60% chromium.  
 Eastern Central Western  
 Carload, bulk .. 9.20 9.50 9.90  
 Ton lots ..... 9.80 10.30 11.80  
 Less ton lots .. 10.10 10.60 12.10

## High-Nitrogen Ferrochrome

Low-carbon type: 67-72% Cr, 0.75% N. Add 2¢ per lb to regular low-carbon ferrochrome price schedule. Add 2¢ for each additional 0.25% N. High-carbon type: 66-71% Cr, 4-5% C, 0.75% N. Add 5¢ per lb to regular high-carbon ferrochrome price schedule.

## S. M. Ferrochrome

Contract price, cents per pound chromium contained, lump size, f.o.b. shipping point, freight allowed.  
 High carbon type: 60-65% Cr, 4-6% Si, 4-6% Mn, 1.25% max. C.  
 Eastern Central Western  
 Carload ..... 15.60 16.00 16.10  
 Ton lots ..... 16.65 17.30 18.50  
 Less ton lots .. 17.30 17.95 19.15  
 Low carbon type: 62-66% Cr, 4-6% Si, 4-6% Mn, 1.25% max. C.  
 Eastern Central Western  
 Carload ..... 20.00 20.40 21.00  
 Ton lots ..... 21.00 21.65 22.85  
 Less ton lots .. 22.00 22.65 23.85

## Chromium Metal

Contract prices, cents per lb, chromium contained, carload, f.o.b. shipping point, freight allowed. 97% min. Cr, 1% max. Fe.  
 Eastern Central Western  
 0.20% max. C .. 83.50 85.00 86.25  
 0.50% max. C .. 79.50 81.00 82.25  
 9.00% min. C .. 79.50 81.00 82.25

## Chromium—Copper

Contract price, cents per pound of alloy, f.o.b. Niagara Falls, freight allowed east of the Mississippi 8-11% Cr, 88-90% Cu, 1.00% max. Fe, 0.50% max. Si.  
 Shot or ingot ..... 45¢

## Calcium—Silicon

Contract price per lb of alloy, lump, f.o.b. shipping point, freight allowed.  
 30-35% Ca, 60-65% Si, 3.00% max. Fe or 28-32% Ca, 60-65% Si, 6.00% max. Fe.  
 Eastern Central Western  
 Carloads ..... 13.00 13.50 15.55  
 Ton lots ..... 14.50 15.25 17.40  
 Less ton lots .. 15.50 16.25 18.40

## Calcium—Manganese—Silicon

Contract prices, cents per lb of alloy, lump, f.o.b. shipping point, freight allowed.  
 16-20% Ca, 14-18% Mn, 53-59% Si.  
 Eastern Central Western  
 Carloads ..... 15.50 16.00 18.05  
 Ton lots ..... 16.50 17.35 19.10  
 Less ton lots .. 17.00 17.85 19.60

## Calcium Metal

Eastern zone contract prices, cents per pound of metal, f.o.b. shipping point, freight allowed. Add 1¢ for central zone; 5¢ for western zone.  
 Cast Turnings Distilled  
 Ton lots ..... \$1.35 \$1.75 \$4.25  
 Less ton lots .. 1.60 2.00 5.00

## CMZ

Contract price, cents per pound of alloy, f.o.b. shipping point, freight allowed.  
 Alloy 4: 45-49% Cr, 4-6% Mn, 18-21% Si, 1.25-1.75% Zr, 3.00-4.5% C.  
 Eastern Central Western  
 Ton lots ..... 12.00 12.75 14.75  
 Less ton lots .. 12.50 13.25 15.25  
 Alloy 5: 50-56% Cr, 4-6% Mn, 13.50-16.00% Si, 0.75 to 1.25% Zr, 3.50-5.00% C.  
 Ton lots ..... 11.75 12.50 14.50  
 Less ton lots .. 12.25 13.00 15.00

## SMZ

Contract price, cents per pound of alloy, f.o.b. shipping point, freight allowed.  
 60-65% Si, 5-7% Mn, 5-7% Zr, 20% Fe.  
 Eastern Central Western  
 Ton lots ..... 12.00 12.85 14.60  
 Less ton lots .. 12.50 13.35 15.10

## Other Ferroalloys

Ferrotungsten, standard, lump or ¼X down, packed, f.o.b. plant  
 Niagara Falls, Washington, Pa., York, Pa., per pound contained T, 5 ton lots, freight allowed. \$1.80  
 Ferrovandium, 35-55%, contract basis, f.o.b. plant, freight allowances, per pound contained V.  
 Openhearth ..... \$2.70  
 Crucible ..... \$2.80  
 High speed steel (Primos) .. \$2.90  
 Vanadium pentoxide, 88-92% V<sub>2</sub>O<sub>5</sub>, technical grade, contract basis, per pound contained V<sub>2</sub>O<sub>5</sub>. \$1.10  
 Ferrocolumbium, 50-60%, contract basis, f.o.b. plant, freight allowed, per pound contained Cb. \$2.25  
 Ton lots ..... \$2.30  
 Less ton lots .....  
 Ferromolybdenum, 55-75%, f.o.b. Langeloth, Washington, Pa., per pound contained Mo ..... 96¢  
 Calcium molybdate, 40-45%, f.o.b. Langeloth, Washington, Pa., per pound contained Mo ..... 90¢  
 Molybdenum oxide briquets, 48-52% Mo, f.o.b. Langeloth, Pa., per pound contained Mo ..... 80¢  
 Molybdenum oxide, in cans, f.o.b. Langeloth and Washington, Pa., per pound contained Mo ..... 80¢  
 Ferrotitanium, 40-45%, 0.10% C max., f.o.b. Niagara Falls, N. Y., ton lots, per pound contained Ti. \$1.23  
 Less ton lots ..... \$1.23  
 Ferrotitanium, 20-25%, 0.10% C max., ton lots, per pound contained Ti ..... \$1.35  
 Less ton lots ..... \$1.40  
 High-carbon ferrotitanium, 15-20%, 6-8% C, contract basis, f.o.b. Niagara Falls, freight allowed, carloads ..... \$142.50  
 Ferrophosphorus, 18%, electric or blast furnaces, f.o.b. Anniston, Ala., carlots, with \$3 unitage freight equalled with Rockdale, Tenn., per gross ton ..... \$58.50  
 Ferrophosphorus, electrolytic, 23-26%, carlots, f.o.b. Monsanto (Siglo), Tenn., \$3 unitage freight equalled with Nashville, per gross ton ..... \$75.00  
 Zirconium, 35-40%, contract basis, f.o.b. plant, freight allowed, per pound of alloy. 14¢  
 Carload lots .....  
 Zirconium, 12-15%, contract basis, lump, f.o.b. plant, freight allowed, per pound of alloy ..... 4.60¢  
 Carload, bulk .....  
 Alsifer, 20% Al, 40% Si, 40% Fe, contract basis, f.o.b. Niagara Falls, carload ..... 5.75¢  
 Ton lots ..... 7.85¢  
 Simanal, 20% Si, 20% Mn, 20% Al, contract basis, f.o.b. Philo, Ohio, freight allowed, per pound Car lots ..... 8.50¢  
 Ton lots ..... 9.25¢  
 Less ton lots ..... 9.75¢

**Boron Agents**  
 Contract prices per pound of alloy, f.o.b. shipping point, freight allowed.  
 Ferroboreon, 17.50% min. B, 1.50% max. Si, 0.50% max. Al, 0.50% max. C.  
 Eastern Central Western  
 Less ton lots .. \$1.30 \$1.3075 \$1.323  
**Manganese—Boron** 75.00% Mn, 15-20% B, 5% max. Fe, 1.50% max. Si, 3.00% max. C.  
 Ton lots ..... \$1.89 \$1.903 \$1.935  
 Less ton lots .. 2.01 2.023 2.055  
**Nickel—Boron** 15-18% B, 1.00% max. Al, 1.50% max. Si, 0.50% max. C, 3.00% max. Fe, balance Ni.  
 Less ton lots. \$2.10 \$2.1125 \$2.1445  
 Silcaz No. 3, contract basis, f.o.b. plant, freight allowed, per pound of alloy. 25¢  
 carload lots ..... 25¢  
 Ton lots .....  
 Silvaz No. 3, contract basis, f.o.b. plant, freight allowed, per pound of alloy. 50¢  
 Carload lots ..... 50¢  
 Ton lots .....  
 Grainal, f.o.b. Bridgeville, Pa., freight allowed, 50 lb and over.  
 No. 1 ..... \$7.50  
 No. 6 ..... 60¢  
 No. 79 ..... 45¢  
 Bortram, f.o.b. Niagara Falls  
 Ton lots, per pound ..... 40¢  
 Less ton lots, per pound ..... 50¢



# O'Mahoney Criticizes WAA's Sales Methods; Finds Costs Excessive

Washington

• • • Charging specifically that costs often exceeded sales proceeds and that improper distribution of dealer-agents hamper the WAA selling program, Sen. Joseph C. O'Mahoney, D., Wyo., has demanded a strengthening of agency agreements and closer supervision of its agents by the disposal agency.

In a staff report by the O'Mahoney subcommittee of the Senate Military Affairs Committee, sales of electronics items—including radio, radar and wire communications equipment—were especially singled out for criticism.

"Of the 153 reported agents in May," the report charged, "one out of four cost the government more than their total sales receipts."

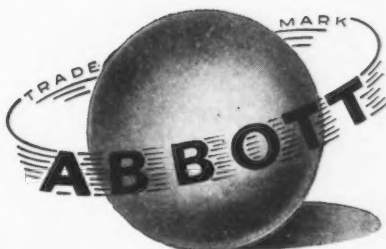
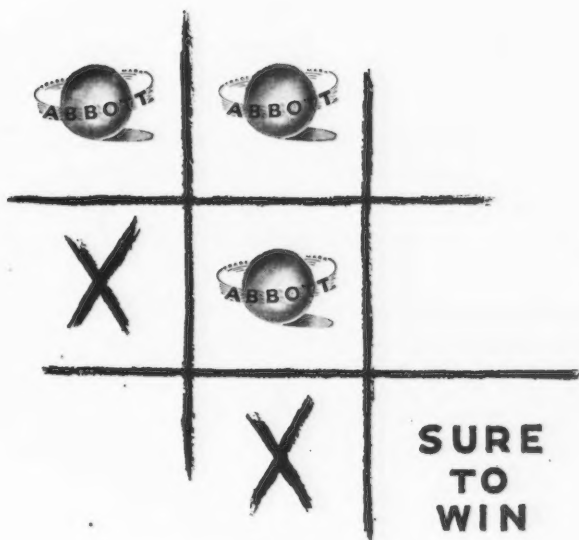
A case in point was cited where one agent was said to have received an inventory of more than \$350,000, had claimed \$8921 for expenses, but had sold only \$5597 worth of goods. An even more extreme case was that of the cutting tool dealer who had incurred expenses of \$40,700 while selling only \$431 worth of items.

Agency agreements and methods for disposal of aircraft parts and components appeared to be satisfactory, the report said, although sales progress was disappointing.

On the other hand, while the subcommittee found much to criticize in the sales methods for machine tools, such as use of the Clayton formula and poor distribution of agents, it also found the rate of disposal to be higher than the average rate for all capital goods with dealer-agents responsible for approximately 65 pct of total sales.

Nearly \$1 billion worth of machine tools had been declared surplus as of June 28. This is estimated to be about 75 pct of the total surplus. On the same date, about \$256 million had been sold for \$123 million, returning about 50¢ on the dollar.

The report admitted, however, that WAA is trying to remedy defects and that once mistakes are pointed out, top officials "cooperated wholeheartedly in bringing to light all the facts and instituted a vigorous campaign" to improve conditions.



BEARING BALLS

THE ABBOTT BALL COMPANY

HARTFORD 10, CONN.



**BY FAST DILIGENCE**  
(Before Steel)

PAINTED FOR JONES & LAUGHLIN STEEL CORPORATION BY ORISON MACPHERSON





## YOU COULDN'T TRAVEL FAR OR FAST—WITHOUT STEEL

Without steel, you would still be traveling in four-horse stage coaches jolting over rough, dirt roads at 5 miles-an-hour. You would be exposed to dust, rain, mud, snow, cold, darkness. You would stop frequently for a change of horses, transfer of the mail and to rest.

Today, because of steel, you may travel swiftly from city to city in comfortable, air-conditioned motor coaches, rolling smoothly on paved highways. You can cross the continent in these luxurious steel buses in less time than it took Great-Grandfather and his bride to go by stage on their honeymoon to Niagara Falls from Boston, New York or Philadelphia.

New steels, such as Otiscoloy, help most efficient operation of motor coaches for comfortable travel. The great strength of Otiscoloy, a high tensile steel developed by Jones & Laughlin, enables weight-saving in coach bodies and frames, and increase of load. Otiscoloy also permits distribution and suspension of weight to insure smoothest riding.

Tomorrow more new steel coaches, arterial highways and convenient terminals will serve you on intercity trips. This service will continue to expand and improve just as travel has done since the days of the horse-drawn diligence in your forbears' time before steel.

**JONES & LAUGHLIN  
STEEL CORPORATION**

PITTSBURGH, PENNSYLVANIA

STRONGER; CONTROLLED QUALITY STEELS



## BUS TRAVEL

Sleeping accommodations, buffet, toilet, smoking lounge, air conditioning are features of new fifty-passenger intercity motor coaches (same size as other buses, only higher). Wider seats, deeper cushions, more space between seats permit greater relaxation. Luggage is carried within the weather tight walls. Highway bumps are smoothed by new system of weight distribution and suspension. Stronger, high tensile steels, such as Otiscoloy permit new design, which reduces dead weight, increases pay load. J&L Otiscoloy also allows wider windows for enjoyment of scenery.

1st year of the Republic, journey by stage coach, New York to Philadelphia, required 3 days; to Boston, 6 days. (Today, by bus, 4 and 7 hours, respectively.)

Because horses were changed every 9 or 10 miles in stage coach days, the turnpikes were lined with taverns flanked by stables, blacksmith shops and harness makers.

"New and finer terminals will mark America's highways," says an advertisement of National Ass'n. of Motor Bus Operators. "And along your bus route will be handsome wayside rest and lunch stations, excellently equipped and staffed to serve you."

"Your feet get wet; your clothes become plastered with mud from the wheel; the trunks drink in half a gallon of water; the gentlemen's boots and coats steamed in the confined air; the horses are dragged and chafed by the traces; the driver got his neckcloth saturated"; wrote Capt. Basil Hall of England about his trip from Fredericksburg to Richmond in 1832, which required 17 hours to cover the 65 miles.

For free print of "By Fast Diligence," by Orison MacPherson, 14x17 inches, in full color, write to Publicity Manager, Jones & Laughlin Steel Corporation, Pittsburgh 30, Pa.

Eight times population of U. S. was passenger load on intercity buses in 1945.

Stage fare in 1812 was \$20 for 6-day trip from Philadelphia to Pittsburgh plus way expense of \$7. Today bus fare for this 9-hour trip is \$6.67 plus expense of two meals.

Bus lines spent \$347 millions (estimated) in 1945 for intercity service alone.

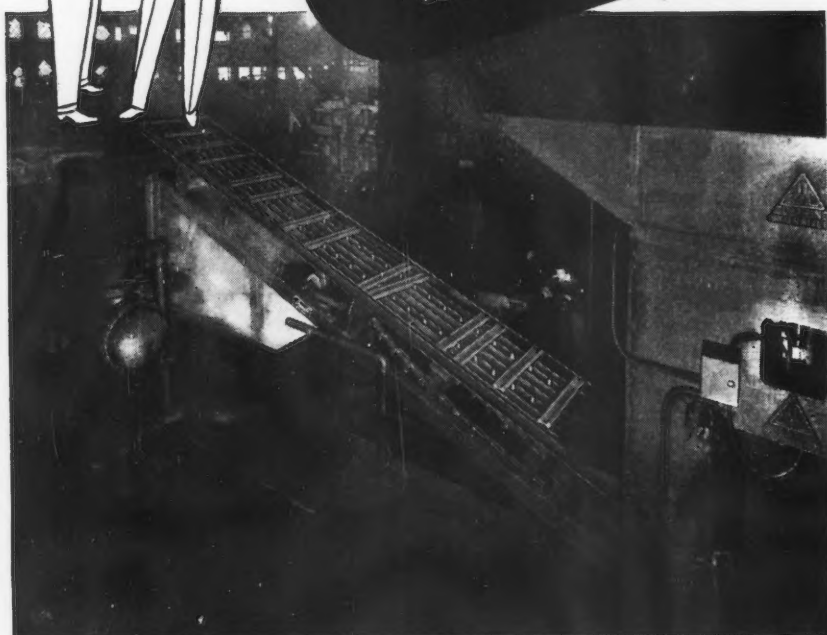
Benjamin Franklin, when postmaster-general, placed milestones on many post roads from chaise equipped with cyclometer.

Helicopters landing on bus terminals is planned by one intercity bus company. Buses and helicopters in combination would provide quicker service.

2-way radio on intercity buses will soon keep them in touch with dispatchers.

Free pamphlet describing properties and use of J&L Otiscoloy steel sent upon request to Publicity Manager, Jones & Laughlin Steel Corporation, Pittsburgh 30, Pa.

# Engineering IS OUR BUSINESS it is a "Must" with us



Logan Chain Conveyor, equipped with dogs for pushing, raises hot railroad splice bars from hydraulic press at right to discharge them onto a chute leading to quenching tank. All handling is by Conveyor.

**Y**es, "you make or break" on the drawing board! That's where the degree of success of a conveyor installation is decided . . . So Logan has developed, through two generations, an engineering staff in which the customer can have every confidence. It is the nearest thing to "predetermined" results which can be offered by a conveyor manufacturer . . . In the steel mill and metal working fields in particular, Logan holds the enviable position of a pioneer with many years of from-the-ground-up experience.

LOGAN CO., INC., 545 CABEL, LOUISVILLE 6, KY.



## Logan Conveyors

PUT FLOW INTO PRODUCTION

### NEWS OF INDUSTRY

#### Navy Plans World's Largest Centrifuge For Supersonic Study

New York

•••The Navy has completed plans for construction of the world's largest human centrifuge—to be used in studying man's reactions to forces developed in flight at supersonic speeds and in testing equipment for new high-speed aircraft and rocket projectiles.

A building to house the centrifuge will be erected at the Naval Aircraft Modification Unit, Johnsville, Pa., by the Bureau of Yards and Docks.

The Navy's human centrifuge will be the only one in the country capable of simulating actual flight patterns, and the building will contain every device developed for the study of human reactions to air speeds approaching 1000 mph.

The centrifuge will resemble in principle an amusement park "airplane" with a cab on the end of a long arm that revolves around a central shaft. The subject in the cab will be suspended in an arrangement of gimbals which will allow him to rotate through the center of the car.

A low-pressure chamber in the cab will permit it to simulate the altitude pressure of 60,000 ft. X ray cameras, capable of taking a series of 12 to 14 pictures per sec, are under development for the device. They will be installed in the cab for study of the effects of acceleration on the subject's internal organs.

The cab interior also will be equipped with signal lights, buzzer, camera, voice box and television screen.

The centrifuge building will be circular, of reinforced concrete construction. It will have three floors, the first containing the storage and service rooms, as well as biochemical, physiological, electronics and chemical laboratories. The second floor, 28 ft high, will house the centrifuge.

Control equipment will occupy the third floor, including a glass-enclosed "control blister" to be sunk 5 ft below the level of the floor to permit greater visibility of the centrifuge chamber below.



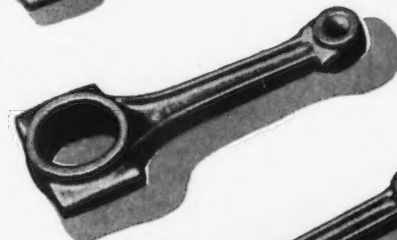
# T & W Forged CONNECTING RODS

## USUALLY COST LESS AT THE POINT OF ASSEMBLY

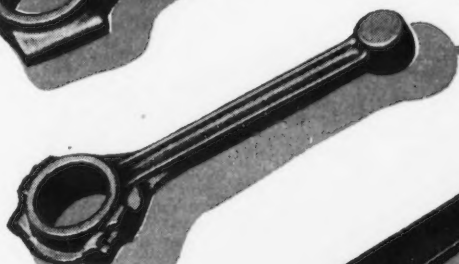
Connecting rod forging weighing approximately 1/2 lb. for outboard motors, paint spray pumps, lubricating oil pumps and other small, compact power units.



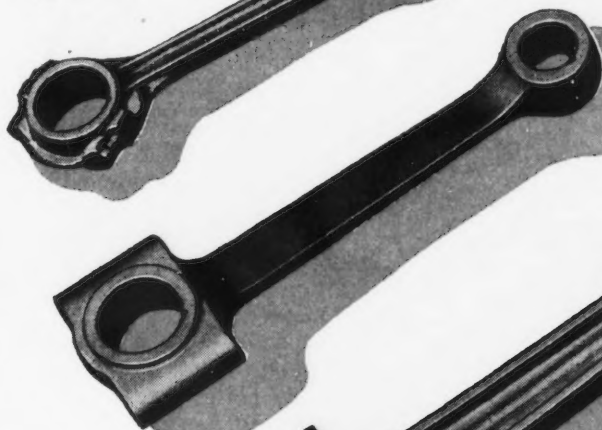
Connecting rod forging weighing approximately 1 1/2 lbs. for use in automobile engines, motorcycle engines, small air compressor units, water system pumps, refrigerating and air conditioning units, and similar types of pumps and power units.



Connecting rod forging weighing approximately 4 1/2 lbs. for automobile, truck, tractor and aircraft engines and similar types of power units.



Connecting rod forging weighing approximately 35 lbs. typical of connecting rods for heavy pumping units, medium-size diesel engines, large gas and air compressors, and a wide variety of other power units and pumping equipment.



Connecting rod forging weighing 382 lbs. for diesel engines for railroad, marine, and stationary use.



There is a difference in connecting rod forgings. Plus or minus a few minutes of time at each stage of operation in producing and finishing a connecting-rod forging will make an important difference in the time it takes to get the forging to the assembly line; and since time is a cost factor, there will be some difference in the cost of the forging at the point of assembly.

T & W forging craftsmen have acquired a broad experience in obtaining the correct distribution of metal and a uniform structure throughout the sections of connecting rods of several different shapes and sizes. T & W forged connecting rods are formed to close weight and dimensional tolerances and usually require less machining and finishing, which makes them cost less at the point of assembly. Ask a T & W Forging Engineer how to obtain reductions in the cost of connecting rod forgings.



**FORGINGS**

**USUALLY COST LESS  
at the Point of Assembly**

# TRANSUE & WILLIAMS

## STEEL FORGING CORPORATION • ALLIANCE, O.

SALES OFFICES: NEW YORK, PHILADELPHIA, CHICAGO, INDIANAPOLIS, DETROIT AND CLEVELAND



### IT'S SMART TO USE SOL-SPEEDI-DRI

Yes, it's smart in more ways than one to use SOL-SPEEDI-DRI. This white, granular absorbent takes the slips and falls out of dangerous, oil-slick floors . . . makes them safe for walking, safe for working! SOL-SPEEDI-DRI steps up production by keeping men on the job . . . by releasing cleaning personnel for more productive work. Only one man is required to apply SOL-SPEEDI-DRI. No complicated expensive machinery is necessary. Just spread it around . . . and floors become safe!

SOL-SPEEDI-DRI soaks up soluble oils, resins, syrups, solvents, acids, and regular oils and greases as a blotter soaks up ink. In time, it will clean up even ancient deposits. SOL-SPEEDI-DRI also reduces the danger of fast-spreading flash-fires, because it will not readily burn even when oil-soaked.

**SUPPLIERS:**—East: Safety and Maintenance Co., Inc., New York 1, N. Y.  
South, Midwest, and West: Waverly Petroleum Products Co., Philadelphia 6, Pa.



### Alcoa Girds For New Competition

(CONTINUED FROM PAGE 99)

duced 70 pct of the sheet sold, today its capacity is 48.4 pct.

From a finished product standpoint, there are many companies engaged in the production of aluminum products. The Aluminum Assn., representing some 30 companies lists in its roster in addition

**TABLE II**  
Alumina Capacity

	Owned or Leased, Lb Per Yr	Pct of Total
Aluminum Co. of America	2,140,000,000	43.7
Reynolds Metals Co.	1,755,000,000	35.9
Kaiser Co.	1,000,000,000	20.4
Total	4,895,000,000	100.0

to Alcoa and Reynolds, such companies as Bohn Aluminum & Brass Corp., Fairmont Aluminum Co., National Bronze & Aluminum Co. Permold Co., United Smelting & Aluminum Co., Harsch Bronze & Foundry Co., and others. These companies make a wide variety of products such as castings, foil, sheet, plate, diecastings, powder, paste and a wide variety of other items directly competitive to both Alcoa and Reynolds.

**Other materials**, such as plastics and, especially, other metals such as zinc, copper, lead and stainless steel are constant competition. Most of these are older materials with a greater backlog of experience in production and fabrication. However, the efforts of Alcoa in the past toward large scale research and development have helped overcome that handicap. Alcoa has consistently maintained an elaborate and complete research program on production and fabricating techniques and on products and markets. Technological research has always been Alcoa's long suit and today is its strongest weapon against competition of any kind.

Secondary aluminum as a source of competition is no idle threat, since tremendous quantities of aluminum produced during the war will eventually find their ways to market as scrap. Since this secondary metal sells for a lower price, approximately half of that of pri-



# If you're welding alloys... Consult Your Arcos Distributor

**NEW ENGLAND and N. Y. CITY**  
Hartford 2, Conn. .... Arcos Corp.

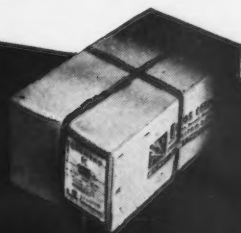
**MIDDLE ATLANTIC**  
Buffalo, N. Y. .... Root, Neal & Co.  
Erie, Penna. .... Boyd Welding Co.  
New York, N. Y. .... Arcos Corp., Hartford 2, Conn.  
New Jersey .... Arcos Corp., Phila. 2, Penna.  
Philadelphia, Pa. .... Arcos Corporation  
Pittsburgh, Pa. .... Williams & Co., Inc.  
Rochester, N. Y. .... Welding Supply Co.  
Syracuse, N. Y. .... Welding Supply Co.

**SOUTH and SOUTHWEST**  
Albuquerque, N. Mex. .... Industrial Supply Co.  
Atlanta, Georgia .... J. M. Tull Metal & Supply Co., Inc.  
Baton Rouge 17, La. .... Louisiana Welding Co.  
Borger, Texas .... Hart Industrial Supply Co.  
Houston, Texas .... Champion Rivet Co. of Texas  
Kingsport, Tenn. .... Slip-Not Belting Corp.  
Knoxville, Tenn. .... Slip-Not Belting Corp.  
New Orleans, La. .... The Gulf Welding Equipment Co.  
Oklahoma City, Okla. .... Hart Industrial Supply Co.  
Pampa, Texas .... Hart Industrial Supply Co.  
Phoenix, Ariz. .... Arizona Welding Eqt. Co.  
Tucson, Ariz. .... Arizona Welding Eqt. Co.  
Tulsa, Oklahoma .... Hart Industrial Supply Co.

**MIDDLE WEST**  
Chicago, Ill. .... Machinery & Welder Corp.  
Cincinnati, Ohio .... Williams & Co., Inc.  
Cleveland, Ohio .... Williams & Co., Inc.  
Columbus, Ohio .... Williams & Co., Inc.  
Detroit, Michigan .... C. E. Phillips & Co., Inc.  
Ft. Wayne, Ind. .... Wayne Welding Sup. Co., Inc.  
Indianapolis 2, Ind. .... Sutton-Garten Co.  
Kansas City, Mo. .... Welders Supply & Repair Co.  
Milwaukee, Wis. .... Machinery & Welder Corp.  
Minneapolis, Minn. .... Machinery & Welder Corp.  
Moline, Ill. .... Machinery & Welder Corp.  
St. Louis, Mo. .... Machinery & Welder Corp.  
St. Paul, Minn. .... Machinery & Welder Corp.  
Toledo 2, Ohio .... Machinery & Welder Corp.  
Wichita, Kansas .... Williams & Co., Inc.  
Wichita, Kansas .... Watkins, Inc.

**WEST COAST**  
Bakersfield, Calif. .... Victor Equipment Co.  
Fresno, Calif. .... Victor Equipment Co.  
Los Angeles, Calif. .... Victor Equipment Co.  
Portland, Ore. .... J. E. Haseltine & Co.  
San Diego, Calif. .... Victor Equipment Co.  
San Francisco, Calif. .... J. E. Haseltine & Co.  
Seattle, Wash. .... J. E. Haseltine & Co.  
Spokane, Wash. .... J. E. Haseltine & Co.  
Tacoma, Wash. .... J. E. Haseltine & Co.

**FOREIGN**  
Honolulu, Hawaii .... Hawaiian Gas Products, Ltd.  
Monterrey, N. L. Mexico .... Electrodo Monterrey, S. A.  
Montreal, Canada .... G. De Peters & Co. of Canada, Ltd.  
Chile, Bolivia, Peru .... W. R. Grace Company  
San Jose, Costa Rica, A. C. .... Distribuidora S. A.  
San Juan 6, Puerto Rico .... Frank Rullan & Associates, Inc.

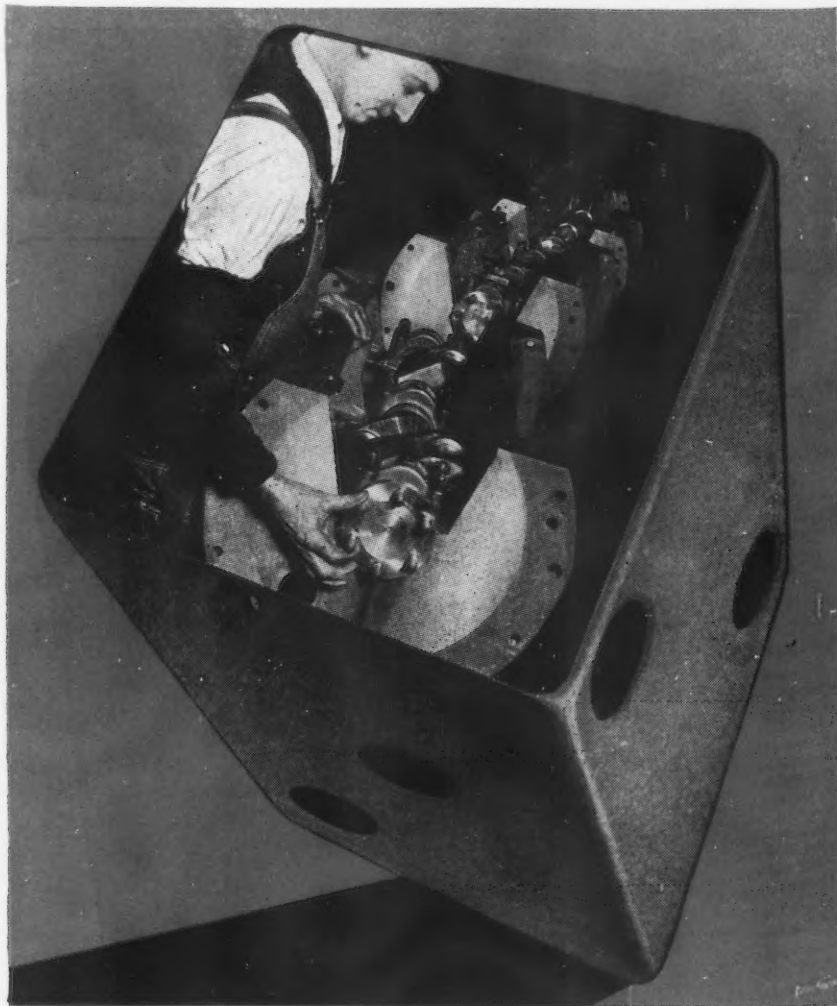


- He is conveniently located and carries well balanced stocks.
- His experience in welding alloys with Arcos electrodes is of real value to you.
- He has ready access to the facilities of the Arcos Research and Engineering Laboratories.
- For out-of-the-ordinary welding problems, he has the Arcos field engineering staff to call on.
- Backing up his entire organization is the long established reputation of Arcos Electrodes — 48 different analyses in all popular sizes for welding chrome-nickel, and straight chrome stainless steels, high tensile steels, bronzes, cupro nickel, monel, and nickel.

Profit by the right combination—Arcos dependable weld metal, serviced and delivered to you by a competent organization.



ARCOS CORPORATION 304 GULF BUILDING, PHILA. 2, PA.



## DON'T TAKE CHANCES with Production Profits!

Profits are at stake if you can't be sure of efficient service from the industrial lubricants you are now using. Don't gamble! Use Penola Industrial Lubricants . . . they can handle every lubricating job in your business efficiently.

Penola lubricants are the product of long research, developed in America's largest petroleum laboratories. *Quality* is the base of Penola Products . . . and their performance reflects their quality.

BE SURE WITH PENOLA.

# PENOLA LUBRICANTS

CHICAGO, ILL. • NEW YORK • DETROIT • ST. LOUIS



PENOLA PRODUCTS HAVE MEANT EXTRA PROTECTION SINCE 1885

## NEWS OF INDUSTRY

mary metal, it will be preferred by some manufacturers and will reduce the market to some degree for primary metal. Of course, the primary producers will consume a certain amount of secondary metal themselves, but the bulk will still be handled through secondary smelters.

Another indication of how Alcoa fears government reprisals is indicated in its recent attitude toward aluminum scrap. Some months ago, shortly after VJ-Day, secondary aluminum prices were ridiculously low—so low in fact that OPA put a floor under which they could not be sold. Alcoa produces certain alloys from scrap and was experimenting successfully with converting aircraft scrap to alumina, filtering out the alumina from impurities, and re-reducing it to virgin aluminum through the Bayer process. Needless to say Alcoa could have purchased huge quantities of this scrap at figures around 1 to 2¢ a lb, whereas today's purchases are nearer 9¢ a lb. The 1¢ a lb price is about right to economically re-process the scrap by the Bayer process.

However, the company wanted no part of cornering the scrap market or jiggering prices for fear the government would step up with

TABLE III  
Sheet Producing Capacity

	Owned or Leased, Lb Per Yr	Pct of Total
Aluminum Co. of America	756,000,000	48.4
Reynolds Metals Co.	466,200,000	29.9
Kaiser Co.	288,000,000	18.4
Others	51,600,000	3.3
Total	1,561,800,000	100.0

some new charges. Alcoa is probably the most gun-shy corporate structure in the country today, the result of about 15 yr at the whipping post with various government departments and agencies trying to break up the organization.

As to foreign competition, with present tariffs and the monetary parity there is not much to fear according to Alcoa officials. However, aluminum has always been a favorite dumping metal. Should the demand slough off, it may be dumped here. Present thinking is that Aluminum Co. of Canada will



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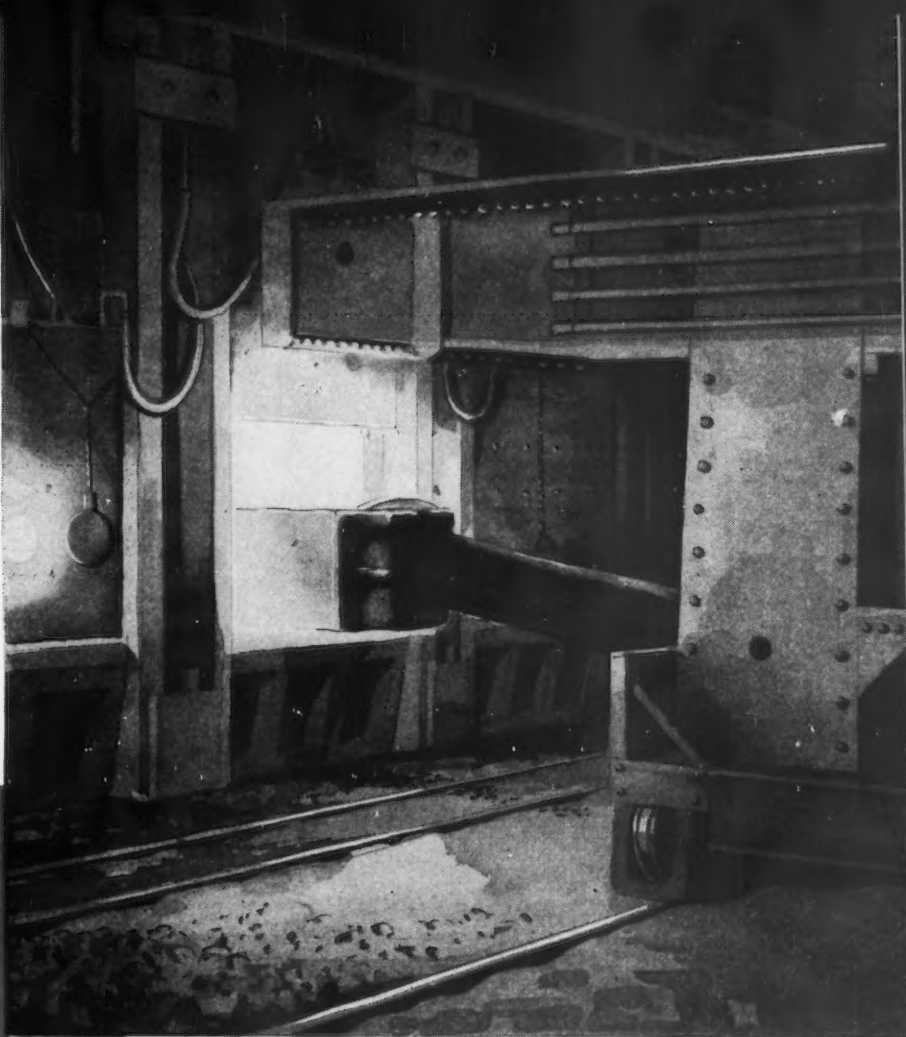
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new

50% Fe Si

development

cuts heat blocking costs

First to advocate and develop 50% Ferro-Silicon for blocking . . . Ohio Ferro-Alloys now offers a new special 50% Blocking Ferro-Silicon that is specially made to penetrate the slag.

get all the facts - - - -

Write Ohio Ferro-Alloys, Canton 2, Ohio or ask your Ohio Ferro-Alloys representative.

FERRO SILICON 50%, 75%, 85%, 90%

H. C. FERRO CHROMIUM • FERRO MANGANESE

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• Surer footing for workers —  
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walkways, ramps, platforms.  
These are some of the advantages  
you get with Multigrip Floor  
Plate.

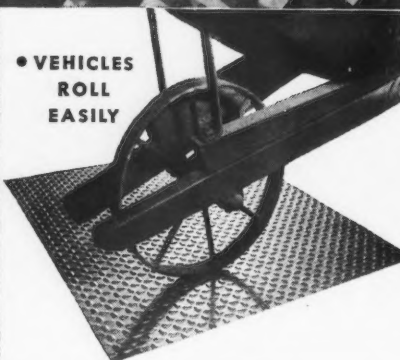
The floors of your factory will  
be stronger, too. They will wear  
longer, when you install U.S.S.  
Multigrip Safety Floor Plate.

Inquire at your nearest steel  
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• SAFE, SURE FOOTING

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Pittsburgh and Chicago

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United States Steel Export Company, New York

# UNITED STATES STEEL

concentrate its sales efforts on Europe, South America and the Orient, and a recent sale of a substantial amount of aluminum pig to England at 12¢ a lb seems to bear out this belief. Had this occurred after the upward adjustment of the Canadian dollar, the price would have been somewhat over 13¢ a lb.

However, as basic power costs remain fairly stable for aluminum plants and interest on bonds continue despite operating rates, in the event of a depressed market, Aluminum Co. of Canada may decide to retrieve some of its costs by underselling American producers in American markets, even though it takes an actual loss on metal production costs. At least, this would be some money coming into the company to pay certain fixed charges. While prewar aluminum imports amounted to about 10 pct of the total aluminum consumed in the United States, in the case of dumping, the Aluminum Co. of Canada, with close to 1 billion lb a year capacity, could really step into the United States and play havoc with the markets. Alcan's low cost water movement of materials and products, low labor costs, low power costs, deep water access, and other factors will enable it to seriously threaten American markets despite tariff barriers.

The attitude of the Aluminum Co. of Canada as to American markets is not known, but in a recent publication the company referred to the revision of Canadian currency values as costing the company's markets in the United States. The article stated that the currency value revision added a cost of 1¼¢ a lb on exports to the United States and effectively removed the company from this market. Based on a 12¢ a lb selling price plus a 3¢ a lb tariff, the juggling of the exchange rate makes Alcan's selling price 16¼¢ a lb against the American price of 14¢ a lb for pig.

The Aluminum Co. of America realizes its competitive problems and the fact that the first invasion of Canadian produced aluminum will be in Alcoa's backyard before it is in the markets of other domestic producers. The company has always led the fight of aluminum v. other materials because it was the only producer, and it feels now that it will have to continue to carry the burden of this job almost single handed. In addition it will get con-



**HOUGHTON'S NEW  
ALL-STAR  
TEAM...**

# 9 RUST PREVENTIVES THAT MEET ALL INDUSTRIAL NEEDS!

Many months of study and evaluation of our extensive rust preventive line since war's end have resulted in the selection of nine Cosmoline varieties to meet industry's needs for corrosion protection.

Whether it be long-term or temporary protection, indoors or out, thin or thick film, you can find your answer in this all-star team. Briefly, here's the line-up:

Four solvent-type, thin film, removable types:  
COSMOLINE 945—Dry film, removable.  
COSMOLINE B—Dry film, wax type.  
COSMOLINE 915—Solvent type, light oil film.  
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One non-removable, dry film—COSMOLINE

110-D—transparent resin varnish, dielectric, adhesive and flexible.

And four oil-type products varying in fluidity and thickness of coating, for severe general-purpose corrosion protection:

COSMOLINE LIGHT . . . COSMOLINE MEDIUM . . . COSMOLINE HEAVY . . . COSMOLINE EXTRA HEAVY (light grease).

These latter four are the result of practical tests by users desiring oil-film protection for storage of war materials and consumer-goods packaging.

A new booklet now on press describes the "Winning Nine," and gives you facts to help select the types you need. For a free copy, write E. F. Houghton & Co., 303 W. Lehigh Ave., Philadelphia 33, Pa.

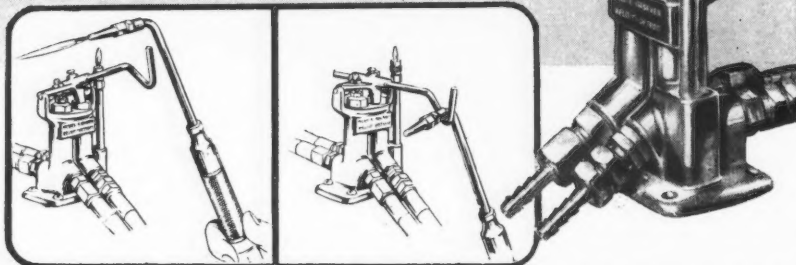
## HOUGHTON'S COSMOLINE\*

\* (Reg. U. S. Pat. Off. 1881)

### RUST PREVENTIVES

# WELDIT GASAVER

- Cuts Gas and Oxygen Cost!
- Eliminates Dangerous Fire Hazard!



With Weldit Gasaver installed the operator simply hangs his torch on the handy lever rod of the Gasaver. The weight of the torch pulls the lever rod down, closing the valves of the Gasaver, thus shutting off both gas and oxygen intake lines. The usual idle flame and needless waste of oxygen and gas between operations is thus eliminated—no fire hazard or danger of injury to workers.

When the torch is again picked up for further welding operations, the operator passes it across

the pilot light of the Gasaver, thereby instantly igniting the torch at the pre-adjusted flame, ready for work—no adjustments to make.

Gasaver can be installed any convenient place on the line between regulators and torch. Most of America's largest production plants are now Gasaver equipped.

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STANDARD AND SPECIAL

Every Type

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Over 22,000 Sets of Dies

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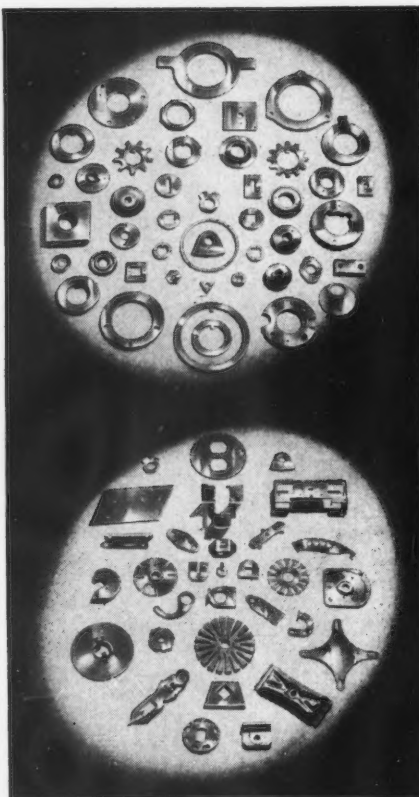
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THE WORLD'S LARGEST PRODUCER OF WASHERS

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## NEWS OF INDUSTRY

tinually more direct competition, as outlined.

The attitude of the two leading domestic aluminum producers, Aluminum Co. of America and Reynolds Metals Co., towards each other is rather amusing. It appears that neither is being wholly realistic about the other. The Reynolds organization, full of fire, brimstone, and the confidence of youth, looks upon Alcoa's sales policies and techniques as somewhat antiquated and, perhaps, a little naive. Alcoa's past achievements are respected, but the Reynolds organization tends to carry a chip on its collective shoulder, daring Alcoa to figuratively knock it off. On the other hand, Alcoa until recently considered Reynolds Metals Co. a young upstart, but now Alcoa gives thanks for the day that R. S. Reynolds decided to go into the aluminum business. The Alcoa organization's attitude is pretty much one of condescension, respecting the enviable morale at Reynolds and its aggressiveness, but pointing out that it has no technologically sound background and doesn't always play the game according to what Alcoa considers Hoyle.

The fact of the matter is, however, that both appear to be so close to the forest that they miss seeing the trees. The Reynolds organization and the Alcoa organization are fundamentally dissimilar. Alcoa's history has been that of a material producer and sold these materials to fabricators that made them into end or consumer products. Reynolds, before it became an aluminum producer, made a wide variety of manufactured goods through a long chain of subsidiaries and sold them in open, competitive markets. Consequently, the psychologies of the two companies are on entirely different planes.

The Reynolds organization knows consumer selling and is acquainted first hand with rough and tumble fights for markets. Alcoa with considerably more dignity and reserve would be at a loss in such a battle. Reynolds likewise will not hesitate to overplay a fast selling line and clean up at the expense of slow moving or less profitable markets. On the other hand, Alcoa feels it has built itself a sales reputation through its past activities and does much of its selling on the basis of its research and metallurgical activities and customer service in consuming fields. It has worked



**Macwhyte**

**ATLAS**

**Braided Slings**

**give you this**

**OPPOSITE LAY**

**construction**

**You get the plus of exceptional flexibility and extreme kink resistance when you use Macwhyte ATLAS Slings.**

This is due to the braiding method used. All left-lay ropes are braided to the right, and right-lay ropes are braided to the left. Thus, the ropes counterbalance each other and keep ATLAS Slings easily manageable at all times. All ropes follow a continuous spiral path throughout the entire body length to provide maximum reserve strength and safety. (There is a total of 8 wire ropes in the sling body.)

Macwhyte's complete line of wire rope slings is designed for easy, economical handling of your materials. Make Macwhyte your headquarters for wire rope slings.

## **MACWHYTE COMPANY**

2911 Fourteenth Avenue, Kenosha, Wisconsin

Manufacturers of the  
**CORRECT** wire rope for your equipment

Braided Slings

Aircraft Cables, Assemblies, and Tie-Rods

Mill Depots: New York · Pittsburgh · Chicago

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These two ropes are left  
lay, but in the sling they  
are braided to the right.

These two ropes are right  
lay, but in the sling they  
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This unique ATLAS construction  
makes possible an extremely flex-  
ible and kink-resistant sling that  
is exceptionally easy to handle.

**Make MACWHYTE your  
headquarters for  
WIRE ROPE SLINGS**



**Here are the facts!**

**... in two interesting sling books**

The complete line of Macwhyte Slings is listed and described.  
Many application pictures show safe ways of rigging up.  
Call your nearest Macwhyte representative, or mail request  
to Macwhyte Company. Ask for Catalogs S-7 and 44-1.

# CHILLED SHOT DIAMOND GRIT

Airless or centrifugal operating machines require Heat-Treated Shot or Heat-Treated Steel Grit.

The ordinary Shot and Grit will not do. They break down too fast and wear away quickly. In other words—expensive at any price.

Our Shot and Grit were made expressly for use in airless machines.

It simply means—

More cleaning at much less cost.

More cleaning and less dust at less cost.

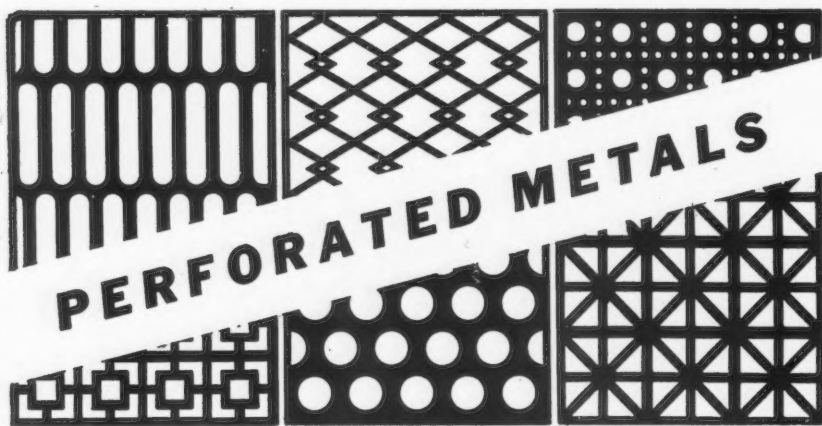
And, remember—any old size won't do.

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out production and fabricating techniques, frequently at great expense, and has developed and pioneered the bulk of the aluminum alloys that are now in use. Last, but not least, it is respected nationally for its integrity and past achievements.

Now, an era of competition is approaching between an up and coming contestant against a long respected and staid champion. New technological developments will probably continue to stem mainly from Alcoa because it is better set up for such activities, but Alcoa is going to learn through experience some of the finer points of tough competitive selling from Reynolds.

Marketwise conditions are somewhat confused at present. The productive capacity of the industry was boosted 700 pct by the war, from about 325 million lb a yr to better than 2 billion lb per yr. Of this amount there is only some 1.2 billion lb of reduction capacity that can be economically operated, making the economical peacetime capacity about 400 pct of that of 1939, the greatest prewar year. Aluminum, as a metal, emerged from the war with tremendous popularity, which is being reflected today by an unprecedented demand. Alcoa indicated that a recent survey showed that upwards of 3500 different items can be economically made of aluminum.

Transportation — land, air and water—in peacetime was the leading aluminum consuming industry, accounting for 29 pct of output in November, 1939; 40 pct in December, 1940; and 63 pct in May, 1942. Aluminum Co. of America estimated that postwar demand by the transportation industry would account for approximately 34 pct of output. Currently, the actual volume of metal used by transportation is substantially greater than before the war, but percentage-wise is only 10.5 pct of output.

The aircraft industry is using more aluminum than before the war, but from its wartime demand has dropped sharply. Use in truck, bus, trailer, and railroad car construction is expected to continue to expand for some years to come, especially in applications where functional parts are involved. The use of aluminum in the superstructures of ships is under investigation and plans are now being formulated for the construction of



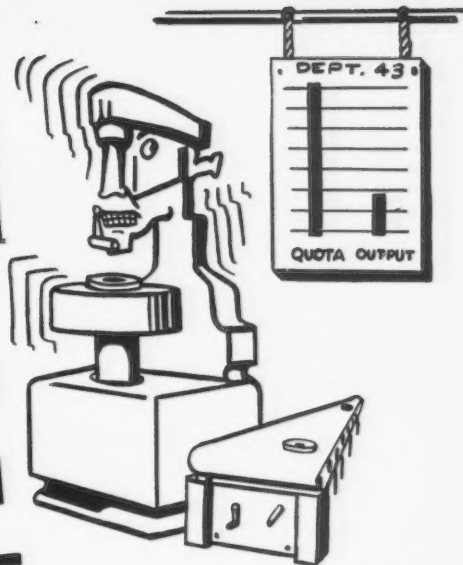
some all-aluminum ships for service in southern waters.

Building and construction have far outrun their prewar rank as an aluminum consuming industry. In November, 1939, construction accounted for 8 pct of the aluminum produced; 5 pct in December, 1940; 3 pct in May, 1942; and it was estimated that postwar demand would be about 9 pct of production. As a matter of record, from January through June, 1946, bookings by the Aluminum Co. of America indicated that architectural uses of aluminum accounted for 11.13 pct of shipments, and roofing and siding, a comparatively new commercial product, accounted for another 15.36 pct of shipments. Thus, aluminum going into construction during the first half of this year totaled about a quarter of the entire production. While this consumption will undoubtedly level off, it indicates a trend toward greater acceptance in building construction and a greater emphasis on the importance of the building industry as an aluminum market. Also, aluminum roofing will force galvanized steel sheet building products to look to its laurels. Sold as flat, crimped, and corrugated sheets, aluminum roofing alone accounted for about 60 pct of Alcoa's architectural book orders during the test period.

Alcoa's production is just about at capacity, both from an ingot or pig standpoint and from the standpoint of finished products such as sheet, strip, wire, tubing, etc. The finished products not being made at peak rates now are, in the main, sand castings and electrical conductor cable, the latter restricted by the shortage of steel core wire.

As to the remainder of the industry, Reynolds and Kaiser, the picture is slightly different. Some of the recently acquired plants are not operating at capacity and won't be for some time. Reynolds plants at Listerhill, Ala., and Longview, Wash., are producing at close to capacity, and finished output at Listerhill is close to capacity. Aluminum reduction at Troutdale, Ore., and Jones Mills, Ark., has not reached capacity, while Kaiser's reduction at Spokane is operating at about 50 pct with the remainder of the plant expected to be in operation by the end of the year. The McCook sheet plant at Chicago, leased to Reynolds, is operating at near capacity. U. S. sheet capacity,

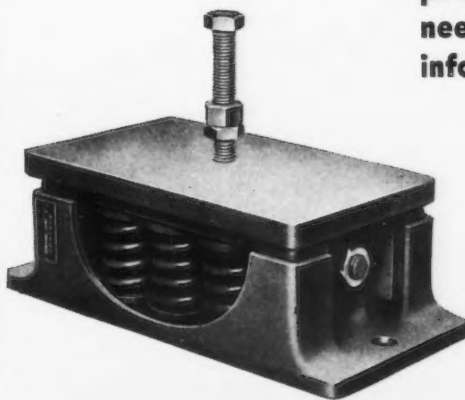
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PUT A  
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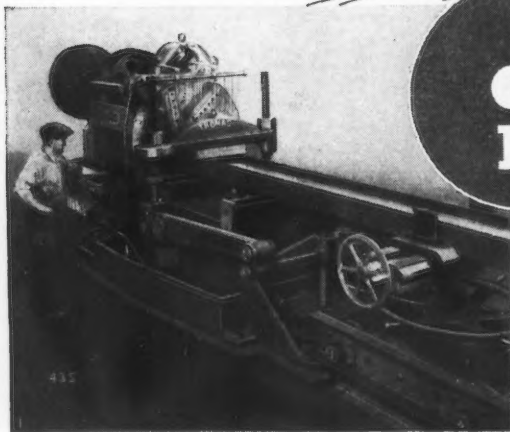
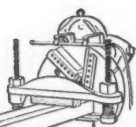


Korfund Type LK Vibro-Isolator shown at left is of steel spring construction with resilient checks at the corners to act as stabilizers. These inserts can be adjusted to the correct damping for the individual installation.

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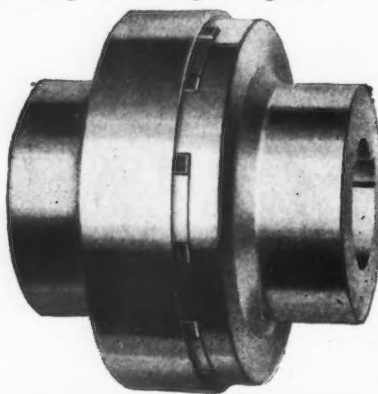
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now rated at 130 million lb a month, can be expected to be increased upon completion of Alcoa's new sheet mill under construction at Davenport, Iowa. Sheet output is currently near capacity, the main exception from a plant standpoint being the Kaiser mill at Spokane. Aluminum reduction currently is not meeting finishing demands and is being supplemented to some extent by purchases of ingot and pig from government stockpiles.

Aluminum, from an industry standpoint, has several factors in its favor. The price structure is favorable, with many consumers having melting capacity enabling them to buy pig at the 14¢ a lb price instead of at some fancy finished alloy price. There has been a tremendous increase in the know-how of aluminum fabrication. Indication of this fact is that while demand for aluminum is as high as during the war and inquiries are at an all-time peak, requests for literature and booklets on its fabrication have declined about 50 to 60 pct. Further, popularity of the "how to do it" motion pictures on aluminum during the war helped spread the knowledge of fabrication methods and techniques.

Alloy and technique developments of the past five years have aided the cause of aluminum as a peacetime product. New alloys, such as 75-S and non-creep metals; new techniques, such as brazing developments and aluminum bearings; and the new uses for aluminum, as in ship superstructures, have all tended to help expand the market. Further, war applications have proved the ruggedness of the metal, and its performance in civilian products during a period when maintenance was at an all-time low has proved its durability under adverse conditions.

Alcoa's interests, like those of many other basic material producers, seems to be turning toward the end product user — the ultimate consumer. The increasing awareness to the user of aluminum is an about face from its traditional policy of selling almost exclusively to fabricators. The company is beginning to recognize this and is turning its attention toward the end-use product, even though Alcoa will doubtless continue to be primarily a basic material producer. Efforts will be expended in trying to sell aluminum on the plane of the user as well as on the plane



of the fabricator. The company is studying product identification methods that can be used to reveal to the ultimate consumer the hidden aluminum in a finished piece of merchandise. This will probably include some method of insuring the user that the aluminum included performs properly.

Alcoa's present cooperative program with department stores throughout the country entitled "Aluminum Living" shows how aluminum is used in the various products sold by the store, tells how the metal is made, and it ties aluminum directly into the product for sale. Another endeavor, market-wise, of Alcoa's is to examine closely its advertising outlets and make certain that its advertising will better identify the product with the end uses.

These, along with programs for the use of aluminum in school shops, in handicraft, and many other educational activities, are among the plans of the company to make people more familiar with the metal, its qualities, characteristics, and advantages.

Final and positive settlement of government action against Alcoa will breathe new life into the organization by removing that sword of Damocles suspended over the company. Until such occurs, caution will be the by-word and the tendency will be toward over-caution and perhaps a mild approach to problems that would ordinarily warrant and get a strong stand from the company. Many observers outside of the industry who have watched the progress of the court trials feel that perhaps the time is at hand to clear up the matter definitely so that Alcoa can go into the postwar period without reservations or a constant fear of government reprisals.

### Surplus Steel Sale Starts

Detroit

• • • A site sale of surplus steel will be held at the Willow Run plant of the War Assets Administration, Ypsilanti, Mich., starting Sept. 26.

Listings show cold-rolled alloy and carbon rounds, squares and plates, tool steel and stainless are being offered after a reserve of items in short supply have been set aside in the Detroit Regional office and identified for exclusive sale to priority buyers including World War II veterans.

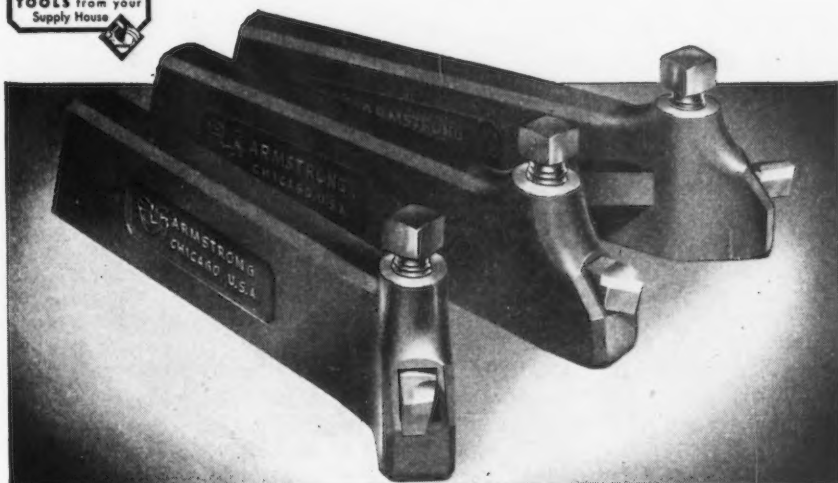
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## NEWS OF INDUSTRY

### WAA in Cleveland Area Sets Aside \$1 Million Worth of Surplus Items

Cleveland

... Quick disposal of over \$1,000,000 worth of surplus "set-aside" items in this area was in prospect as O. E. Thomas, Cleveland regional director of the War Assets Administration, announced that an intensified drive is now under way to expedite the flow of merchandise into the hands of war veterans.

The list, recently expanded, includes automotive equipment; agricultural, restaurant and office equipment; and medical supplies and instruments—all items that are in such heavy demand and short supply that WAA is allotting them to former servicemen exclusively, according to Mr. Thomas.

Because demand far exceeds supply, it is doubtful whether WAA will be able to fill every order, or even a majority of them. There are now 37,495 applications on file for surplus automotive equipment and only 624 pieces available for sale in the Cleveland area. These include trucks, trailers, passenger cars, station wagons and tractors.

All agricultural equipment in the northern Ohio-western Pennsylvania area has been released to veterans, and the waiting list still numbers 754.

WAA is somewhat better stocked to fill the demand for medical equipment and instruments. It has a file of 2281 applications and an inventory of 842 units, much of it small instruments.

However, Mr. Thomas pointed out, in instances where there is an abundance of set-aside goods, WAA will transfer it from one of its 33 U. S. regional areas to another to assure an equitable distribution among ex-servicemen.

Special efforts are also being made to induce the owning agencies—in most cases the Army and Navy—to release additional quantities of set-aside items as surplus, enabling WAA to turn them over to veterans for use in their businesses and professions. Six men from WAA's Cleveland office are canvassing all military installations in the region in an effort to appropriate as much of the scarce surplus merchandise as possible.



## Machinery Demand To Continue, Says Witherow

Pittsburgh

• • • The urgent need for producer goods and for American engineered industrial and construction machinery and equipment will continue for some time to come, according to William P. Witherow, president of Blaw-Knox Co., in a statement at the annual sales meeting of the company. "Engineering manufacturers of production machinery and equipment have a vital responsibility during these days of material shortages in meeting this critical need," Mr. Witherow said.

Sales engineers, production men, engineering staff members and department heads, including representatives of the company's overseas staff and all district offices—a total of over 300—attended this first postwar meeting.

Chester H. Lehman, executive vice-president, discussed the sales program of the company and pointed out the need for a high type of sales engineering service to industrial and construction consumers.

## Oldsmobile Supplies Vets With Special Cars

Detroit

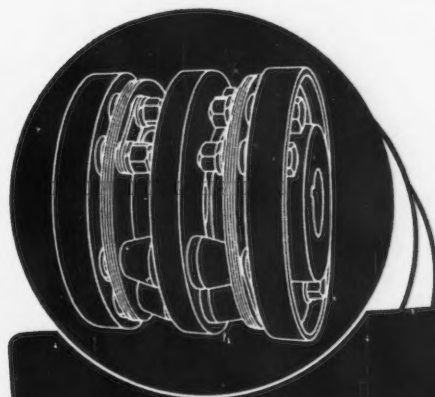
• • • That the government's new \$30 million project to supply cars free to certain disabled veterans of World War II is making considerable progress is attested by the fact that during August a total of 1467 new Oldsmobiles, equipped with hydramatic drive and special controls went to disabled veterans in all parts of the country according to an announcement by S. E. Skinner, vice-president of General Motors and general manager of Oldsmobile.

It is predicted that September volume will probably exceed that of August, Skinner said. Reports from all zones of the country indicate the demand for these specialized cars is increasing. Total orders received from dealers at the end of August numbered 5831.

Acceptance of the program was so immediate that at one time Oldsmobile's supply of special driving aids was practically exhausted. Production of these special parts has been greatly increased.

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100% dependability is demanded

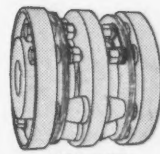


**THOMAS**  
*flexible* COUPLINGS

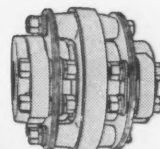
provide for  
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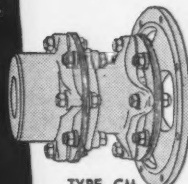
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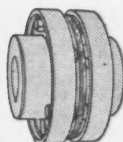
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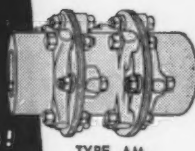
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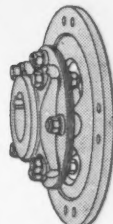
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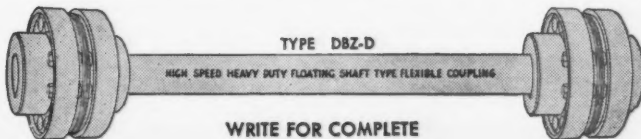
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TYPE AM



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## ASM Technical Program At Fall Metal Show Features 18 Lectures

Cleveland

• • • Eighteen educational lectures on four timely metallurgical subjects will feature the technical program of the American Society for Metals during the National Metal Congress and Exposition at Atlantic City, Nov. 18-22.

W. H. Eisenman, ASM secretary, said in addition to this series of lectures, more than 70 technical papers will be delivered during the five days of the National Metal Congress-ASM meetings.

"Electronic Methods of Inspection of Metals," "Physical Metallurgy of Aluminum" and "Sleeve Bearing Metals" will be subjects of five lectures each. "The Structure of Cast Iron" subject will be covered in three lectures.

The "Electronic Methods of Inspection of Metals" lectures will be given during the afternoon periods Monday through Friday of

the Congress week. Authors in this lecture series include Harry Hamburg, Chance Vought Aircraft, Stratford, Conn.; J. L. Saunderson, Dow Chemical Co., Midland, Mich.; R. S. Segsworth, General Engineering Co., Toronto, Canada; Charles Lickey and Harold T. Clark, Jones & Laughlin Steel Corp., Pittsburgh; C. S. Barrett, Carnegie Institute of Technology; E. O. Dixon, Ladish Drop Forge Co., Milwaukee; and Mrs. G. H. Tyne, Allied Control Co., New York.

"Physical Metallurgy of Aluminum" lectures will be given on Monday, Tuesday and Wednesday evenings and during the Thursday and Friday afternoon sessions. Its authors include W. L. Fink, F. Keller, W. E. Sicha, J. A. Nock and E. H. Dix, Jr., all of Aluminum Co. of America, New Kensington, Pa.

Five lectures on "Sleeve Bearing Metals" will be presented during the afternoon sessions on each of the five days. Six authors have prepared lectures on this subject. They are R. W. Dayton, Battelle

Memorial Institute, Columbus; F. R. Hensel, P. R. Mallory Co., Indianapolis; Edwin Crankshaw, Cleveland Graphite Bronze Co., Cleveland; A. F. Underwood, General Motors Research Laboratories, Detroit; J. Palsulich, Wright Aeronautical Corp., Paterson, N. J., and William H. Tate, Glacier Metals Ltd., England.

Alfred Boyles of the U. S. Pile & Foundry Co., Burlington, N. J., is author of the three lectures on "The Structure of Cast Iron." This series will be presented on Monday, Tuesday and Wednesday at the evening sessions.

## Study German Foils, Light Metals, Bimetals

New York

• • • The production and use of light metals, bimetallic strip and foil are now being investigated in Germany by U. S. technicians. The investigation is sponsored by the Metals and Minerals Unit of OTS' Technical Industrial Intelligence Division, Department of Commerce. Five investigators have been loaned to TIID by the Aluminum Co. of America, Pittsburgh. Their work will supplement an investigation made last year by representatives of the Reynolds Metal Co., Sheffield, Ala. They are: Dr. Francis C. Frary, Oakmont, Pa., director of research; Benjamin C. McFadden, chief mechanical engineer; Conrad F. Nagel, Jr., New Kensington, Pa., chief metallurgist; Aaron J. Rice, Badin, N. C., engineer in charge of development; George D. Welty, production manager for forgings.

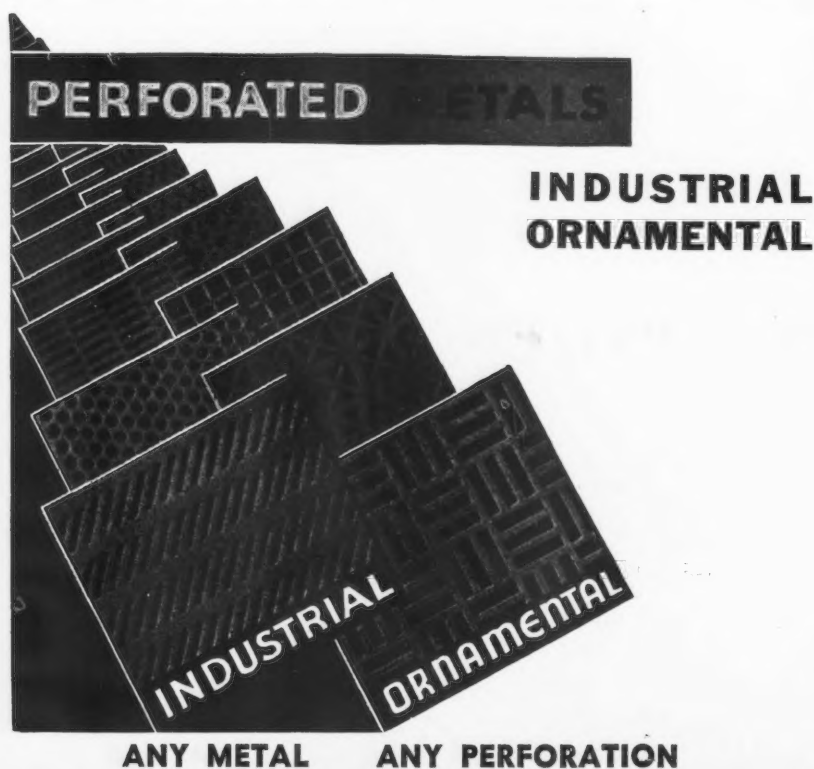
Mr. Helmich W. Boessenkool, vice-president in charge of research, Metals and Controls Corp., Attleboro, Mass., will investigate German use of bimetallic strip and manufacture of metal foil.

## Appoints Foreign Manager

Detroit

• • • Henry Ford II, president, has announced that R. I. Roberge has been appointed manager in charge of all Ford foreign operations. The appointment is effective immediately.

All personnel of the former foreign operations division, together with the functions and responsibilities of the division, have been transferred to the international division, according to Mr. Ford.



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## Gallup Polls

(CONTINUED FROM PAGE 91)

full of Communists, radicals and soreheads."

On the other hand, the main thing wrong with the AFL in the opinion of rank and file CIO men, is that it "doesn't do enough for its members."

Those two criticisms top the list of things that AFL men don't like about the CIO, and that CIO members don't like about the rival AFL.

To sound out those views the institute asked AFL members polled in one of its regular cross-section surveys, "What is your main criticism of the CIO?" Of CIO members it asked, "What is your main criticism of the AFL?"

Here's what AFL members think is wrong with the CIO.

- (1) The CIO is run by Communists and radicals.
- (2) It calls too many strikes.
- (3) It has poor leadership.
- (4) It doesn't look after the welfare of its members enough.
- (5) It holds too much power, and abuses that power.
- (6) The CIO is never satisfied; always complaining and trying to get more.
- (7) It dictates too much to its members.

Here, on the other hand, is what the CIO members have to say about the AFL:

- (1) The AFL doesn't do enough for its members; not energetic and ambitious enough.
- (2) It isn't run democratically—the rank and file don't get enough to say.
- (3) AFL leaders are inefficient, old and tired.
- (4) It calls too many strikes.
- (5) Too many crooks and gangsters in the AFL.
- (6) AFL plays ball too much with management.

## London Economist

(CONTINUED FROM PAGE 97)

20 pct of its total disposable income. Since then the total of disposable incomes has risen very considerably. But at present savings are only 14 pct. Unless all previous economic observation is at fault, this cannot be a stable position. Sooner or later, a larger



• Picking up a load and placing it on the exact right spot is only as efficient as the crane that lifts and carries and lowers its cargo.

Balanced drive gears with automatic oil bath lubrication—permanent alignment—anti-friction bearings—give Shepard Niles cranes precision control operation and more dependability under constant load handling. Shepard Niles cranes are designed and built for tough, long service with a thor-

ough knowledge of the performance expected of them.

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Our staff of engineers are ready today to help you to plan a better, more economical handling system. Write them.



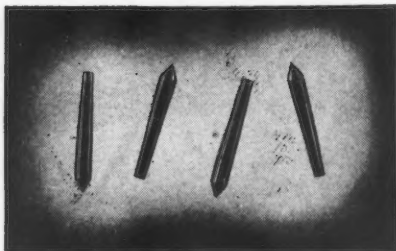
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Starting with special heat-treatable steel, the 60° angle is preformed and the tiny piece cut off to size. In our own heat-treating department, each individual center is heat-treated to Rockwell C 62-64. The finishing operations . . . the production of diameters and tapers . . . are then performed by a combination of centerless and cylindrical grinding. The availability of both types of grinding at Ace makes it possible to turn out these pieces fast and economically.

This is one of many examples of the fine precision work Ace delivers on small parts and assemblies that involve stamping, machining, heat-treating and grinding. Ace offers manufacturers the complete modern facilities and the managerial know-how to turn out such parts quickly, accurately, and in mass-production quantities. Send us a sample or blueprint for prices and ideas.



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138—THE IRON AGE, October 3, 1946

income will have its natural consequence of larger savings. Consumption expenditure will recede from its present abnormally high level.

The real test is therefore to come. From this side of the Atlantic the greater difficulty has always seemed to be, not to maintain full employment immediately after the end of the war—the large pentup demand would see to that—but to maintain it later on when this nonrecurring source of demand has been worked off. The low rate of present net savings (that is, the high rate of consumption expenditures) means that many millions of people are spending their wartime savings. But a recent survey has shown that the overwhelming majority of people have only very small accumulated resources.

For the moment, however, these are predictions. There is no saturation of the demand for consumption goods yet visible; on the contrary, all the talk is of scarcities. Capital construction, though it is rising rapidly, is not yet excessive; nor has it reached fruition. Demand is still manifestly in excess of supply. It is true that the pipeline of supply is filling up and that it will soon begin to gush forth in gigantic volume. But it is very difficult to believe that, even within the six to nine months to which the Stock Exchange's prophetic vision may extend, a substantial change is likely in the present trends, which are all upward and inflationary. If there is a sharp break on Wall Street in September 1947, it will be time to fear the worst—but hardly yet.

The present flurry of anxiety will, however, have served a useful purpose if it has directed attention to the foundations on which the postwar order of international society is being built. It is the observed fault of postwar settlements that they are apt to build their structures on hopes and dreams rather than on realities. It has already become apparent that the political structure of the United Nations, in building on the assumption that the Big Three could work together, was built on sand and can hardly function at all in the world of reality. Are we all quite sure that, in building the structure of the world's new economic and financial arrangements on the assumption of American stability, we are not making the same mistake?



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